

AMERICAN VETERINARY REVIEW.

JULY, 1904.

EDITORIAL.

EUROPEAN CHRONICLES.

PARIS, FRANCE, May 15, 1904.

THE MUTUAL BENEFIT ASSOCIATION.—A few years ago I suggested to our *confrères* in America the formation of a mutual benevolent association, and I pointed out the great humanitarian benefits that could be derived from such an organization. The question seemed to attract but little attention, and yet it was not ignored entirely; it had found some thinking minds, who did not let the problem drop, and, before we knew it, it was brought forward by one of the presidents of the A. V. M. A., Dr. Winchester, and Dr. Dougherty, of Baltimore, urged the creation of an association by the presentation of a draft of by-laws at the fortieth annual meeting at Ottawa last year. The ball was started; discussions occupied part of the meeting, and finally the question remained open by resolution of the association. In a few weeks the forty-first meeting will be held in St. Louis; there is no doubt that the friends of a mutual benevolent association will meet and be prepared to push the good work forward. It has seemed to me that I could furnish them with weapons to defend their object.

* * *

The great difficulty in the realization of the work of such an undertaking is the question of finances. Will such association ever be able to keep to its promises? Will it ever have capital enough to be lasting? I know that our friends who urged the

formation of an association are already well provided with material to answer these questions by the information that they have obtained from similar organizations existing in other countries. I have lately seen the *comptes rendus* of the last meetings of two associations in Paris, and in them I have found figures which were so surprising to me that I felt it my duty to record them here.

For instance, the Association Centrale des Vétérinaires de France, which this year counts 131 members more than last year—1058 in 1903 against 1189 in 1904—has in December, 1903, 95,941 francs as a reserve fund, private donations to which raised it to 104,792 francs (say \$21,000). This association has existed since 1892.

The other society I refer to seems to be a local affair, as it has its seat in one of the western departments of France. It was founded in 1902 only, and counts to-day already 500 members. The object of the society is to collect at the death of each member a stated sum from each individual belonging to the association and turn it over to his heirs, widow or children.

After all, such association is nothing else than a savings bank, which is not costly, and brings a comparatively good sum when one dies. I know of a society which gave \$1,000 to the family of one dead member, who during his life paid in an average of \$13 a year. In supposing that he had joined the society when 21 years old, to lose money he would have had to live up to 98 years, as even at 97 the \$1,000 his family would receive would be the money he had paid during his membership.

A mutual veterinary society cannot be ignored, and should the A. V. M. A. decline its foundation, other humanitarians ought to work it up.

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THE PHYSIOLOGY OF CRIB-BITING.—Numerous have been the theories presented by observers on crib-biting and wind-sucking of horses—as to their nature, causes, and physiology. The question has been again taken up by Dr. Malkmus of Hanover, and an account of his observations is published in the

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Deutsche Thierarztliche Wochenschrift. In times gone by cribbing was considered as resulting from an eructation, expulsion of gases contained in the stomach ; but, of course, the anatomical construction of the stomach and of the cardia render this theory inadmissible. A second theory held that it was due to air being swallowed. But Dieckerhoff opposed it, saying that the position of the head and neck during the act of cribbing was very different from the act of deglutition of water. There is a complex condition which is incompatible with that of swallowing. After upsetting the theories so far advanced, Dieckerhoff gave the following definition : "Cribbing is a vicious habit which consists in an abnormal act of respiration, during which the horse rests his head or holds it temporarily in an almost vertical position, and by a strong inspiratory dilatation of the thorax, allows the introduction in the pharynx and larynx of a column of air, accompanied with a special noise. The introduction of air in the oesophagus and in the stomach does not take place in every instance."

So as to verify the correctness of this third theory, Prof. Malkmus has invented a special pneumograph to make a tracing of the movements of the thoracic cage. He observed, then, that during the act of cribbing the curve traced showed no other change than one break, indicating a strong and short movement of expiration and corresponding sometimes to the time of inspiration or again to that of expiration. Therefore, the theory of Dieckerhoff is not correct : Cribbing is not an inspiratory act. This break in the curve has no specific value. It is observed every time an animal is disturbed from a quiet condition to make a sudden energetic motion, such as to glance rapidly around it, to chase flies, etc. It results from the sudden contraction of the abdominal and dorsal muscles to fix the thorax or the vertebral column.

In all forms of cribbing there is a peculiar contraction of the cervical muscles, specially those which extend from the sternum and shoulder to the larynx and inferior maxillary. This contraction produces the fixity of the superior maxillary

and lowering of the larynx, acts which are facilitated by the resting of the inferior extremity of the head upon a surrounding object. In the wind-sucker, the superior maxillary is carried forward and downward. The inferior maxillary does not follow in the general movement; it remains a little backwards and as a consequence produces the opening of the mouth. The depression of the larynx and the fixation of the lower maxillary are realized by the contraction of the sterno-thyroideus, sterno-hyoideus, omo-hyoideus, etc. The depression of the larynx and lower jaw give rise to an opening between the base of the tongue and the soft palate. The air rushes in this open vacuum from the mouth and nasal cavities, and produces the noise heard during cribbing.

Prof. Malkmus gives the definition of cribbing as follows: "A vicious habit consisting in a sudden dilatation of the pharynx with noisy rushing of air into it, preceded by the steady fixed position of the head forward and the depression of the larynx"; and he concludes by saying that if cribbing is shown under different conditions, there are certain unmistakable symptoms that it is almost impossible to confuse with anything else.

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THE DIPLOMA IN HYGIENE—THE EDINBURG SCHOOL TO REMOVE TO LIVERPOOL.—A short time ago, there appeared in the *Veterinary News and Bulletin* a little editorial notice announcing a rather important item in the veterinary world. The dean of the Faculty of Medicine of Liverpool University had made it known that the authorities of that institution had instituted a Diploma in Veterinary Hygiene, on parallel lines to that of Public Health granted to medical men. Of course, this was serious information, and gossip was harsh against the Royal College of Veterinary Surgeons not to have been the first to institute such a diploma itself. A little consolation was given by the suggestion that perhaps this diploma was unnecessary and that consequently the scheme would prove a failure.

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H., was properly arranged and announced. It was to be awarded only to candidates who possessed the registrable qualifications to practice veterinary medicine, and therefore were regular practitioners, M. R. C. V. S. They had to attend an approved course of study and pass an examination in hygiene, as applied to veterinary medicine; microscopy; comparative bacteriology, pathology, and parasitology; toxicology and jurisprudence; etiology of infectious diseases of animals; sanitary law and administration; sanitary reporting; reporting of cases of infectious diseases.

I do not exactly know what the curriculum of the veterinary schools of Great Britain is, but if all the branches which compose the new addition to the Liverpool University were not taught at those institutions, certainly their course was incomplete; and if they were there can be but little use for a new institution. Hygiene and sanitary medicine are important parts of veterinary education and have chairs in all European schools.

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But that is not all. Scarcely had the excitement produced by the information I have just alluded to begun to subside, than another of greater importance found its way into the English papers.

The new veterinary college of Edinburg is to be removed to Liverpool in the early fall. Prof. Williams, for reasons entirely connected with the welfare of his institution and the elevation of the profession, abandons his birthplace, leaves Edinburg to go to Liverpool. This is considered by many in the profession as a good move, as an additional good omen for the future prosperity of the college; and, better facilities being offered, it is also proclaimed that a greater number of students will attend at Liverpool than at Edinburg. It is no doubt to the credit of Prof. Williams to have undertaken such a change. It is said that there may be some difficulties in operating it, because of objections from the Royal College, or on account of the charter, etc. Of course, of these I know but little, but, after

all, I am sure Prof. Williams knows pretty well what he is about, and even if, as suggested, the whole matter resolves itself on the question of financial improvement, I must compliment him. Private institutions have often been considered as money-making undertakings. This is an error, and if for philanthropy they are carried out for a number of years at a financial loss, there is no reason why steps cannot be taken to change this, especially when with it improvement in other directions can be obtained for the benefit of students.

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There has been, however, another suggestion made in relation to this removal of the new veterinary college, viz., that it was the result of an understanding by which the college was to become affiliated with the University, the authorities of this institution having considered favorably plans presented by Prof. Williams. This idea, however, has received a flat denial from the learned principal of Edinburg, which he made before the Council of the Royal College. He said: "I have no intention of selling or bartering my college in any way with anybody or any company of people in Liverpool. I retain the New Veterinary College, as it has been ever since its foundation."

All these are very good; but cannot, at the same time, the question remain—with such an excellent school as that which Prof. Williams presides over, where the curriculum must and no doubt is most perfect and complete, of what use becomes the School of Veterinary Hygiene? Will an M. R. C. V. S. (Edinburg, Liverpool, Dublin or London) care for an additional D. V. H.? At that rate, veterinary titles will become as varied and much larger than those that are found in the United States.

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RELATION OF VETERINARIANS TO ANIMALS.—To close this chronicle, let us have a little statistic, which I find is extracted from the *Fortschritte der Veterinar. Hygiene*, published by Dr. Nagorsky. It was made up for the preparation of the sanitary laws in Russia in 1902. It makes a comparison between different states of the number of veterinarians, number of

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horses and bovines that each practitioner may have to care for and the area of ground he has to travel. In Germany there are 3,516 veterinarians, with 6,086 animals spread on a surface of 153 kilometres; in France 3,389 veterinarians for 4,863 animals on 129 kilometres; in Great Britain 2,698 veterinarians for 3,929 animals on 116 kilometres; in Austria 957 veterinarians for 10,710 animals on 312 kilometres; in European Russia 853 veterinarians for 49,343 animals spread on 5,036 kilometres; Hungary has 732 veterinarians for 9,043 animals spread on 444 kilometres.

I do not know if attempts have been made to establish similar statistics in the United States, but one of the officers of the Bureau of Animal Industry might undertake it with the assistance of all the colleges; the correct number of regular graduates could be obtained, the proportion of animals be established. The great difficulty might be in approximating the surface of ground where the animals would be.

* * *

There have been experiments made in some of our experiment stations in the United States with the use of molasses as food for stock. I would be thankful for any reports which have been printed if they be addressed to me here. A. L.

THE WORK OF THE B. A. I. APPRECIATED.

The recent annual meeting of the American Medical Association, at Atlantic City, N. J., was by long odds the largest and best from all points of view ever held by it, there being 2,894 registrations, about 600 in excess of any previous meeting. Many collateral associations held sessions in conjunction with it, and sectional work was the order of the day. In one section the Departments of Scientific Research of the Government were considered, and among them "The Bureau of Animal Industry: Its Service to Medical Science" was the basis of a paper by Dr. W. H. Welch, of Baltimore, Md. Among other things, he said that "this bureau had been established in 1884 for the purpose of conserving the animal industry by the study and control of

the diseases of animals that caused the greatest losses. Diseases affected animals just as they did human beings, and their pathology was the same, consequently their study threw much light on the science of medicine. Some of the results of the scientific researches of the staff of the Bureau of Animal Industry had been the eradication of pleuro-pneumonia of cattle by killing both the diseased animals and those that had been exposed to infection, which effected a saving of millions of dollars. Foot-and-mouth disease had been eradicated in a similar way. A study of hog cholera had led to the finding of its bacillus, which had pointed the way to the research study of immunity. One of their most brilliant attainments had been the control of Texas fever by the discovery of the microorganism, a protozoal parasite which was conveyed by the cattle tick. They had collected important information about rabies, and had studied animal parasites and taken measures to exclude the introduction of Oriental parasites into this country. They had been studying tuberculosis for over ten years. They had discovered that immunity in cattle could be attained by injecting attenuated cultures. They had investigated Koch's theory of the transmission of tuberculosis and had proved that cattle could be infected by human beings, and it seemed that the reverse might be possible. He hoped that national legislation might be secured by which the Government would take as great interest in the study of human disease as it had shown in the study of animal disease."

Dr. D. E. Salmon, Chief of the Bureau, showed the interdependence of the two branches of medical science in his remarks on "The Service of the Medical Profession to the Bureau of Animal Industry," saying that he had been engaged in the work of this bureau for twenty years. He had found that no matter how useful and effective the work might be, it needed the support and encouragement that could be given from outside sources. He proceeded to explain their methods of protecting the food supply by preventing animal diseases and by insuring a bountiful supply of food for the future. They maintained stations for the inspection of all animals coming into or going

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out from this country. All animals in large abattoirs were inspected before killing and after they were dressed. That such supervision was absolutely necessary was shown by the fact that out of 37,000,000 cattle inspected annually, 65,000 were unfit for use as food, and 18,000,000 animals had been shipped under supervision and the cars that they occupied disinfected afterward. This work was met by enormous opposition from commercial interests. It very often seemed that there was no conscience and no philanthropy in commercial life. In the investigation of disease, they were constantly met by those who were opposed to experimental work on animals, entirely losing sight of the great ends that were furthered through this means. There was a never ending battle to be waged with this class of people, and here the medical profession could give great assistance to the bureau. The freedom of the investigator must be preserved if important problems were to be solved that would secure a pure and abundant food supply and help the science of medicine as well. The medical profession should support this work by assisting to secure the right to use the most effective remedy for the eradication of disease, and in the right to produce pure immunizing agents. This meant a continual conflict between commerce and philanthropy, and the moral support of the medical profession would be of great assistance to the cause of philanthropy.

THE EXISTENCE OF RABIES.

It is peculiarly annoying to scientific medical men to read at frequent intervals interviews in the daily press with officials of the Society for the Prevention of Cruelty to Animals in which they utterly ignore the conclusions of the medical world in regard to this disease, and give utterance to opinions in direct antagonism to proven facts. That such a disease as rabies does exist to a considerable extent in this and almost every other country is no longer denied by any medical man who is open to conviction and who gives any credence to the evidence that is constantly placed before him, even though he has failed to come in

contact with the disease in his daily practice. That a layman so well posted upon animal diseases as the President of this Society undoubtedly is, should set up his opinion against the overwhelming evidence presented by the Federal Bureau of Animal Industry, which has very thoroughly investigated the subject and published its conclusions, accompanied by the data by which such conclusions were reached, is incomprehensible. And yet we find an interview with President Haines in the New York *Herald* of recent date in which the admission is guardedly made that there *is* such a disease as rabies, but that the chances of any living person ever coming in contact with it is extremely remote. To substantiate this he states that his inspectors have never met with a single case in the many years that they have done duty in New York City. And, yet, almost every veterinarian in that territory diagnoses the disease frequently, some many times each year. The merest tyro in veterinary science understands that there is no connection between the frequent cases of convulsions in street canines and true rabies; that there will be dozens of instances where dogs are attacked by cerebral congestion (due to excitement, teething, distemper, indigestion, and many other causes), and which bring on a train of symptoms which citizens and the police distort into the meaningless cry of "mad dog," where there is a single case of rabies; that there is very little similarity between the symptoms of the two conditions. But when a gentleman holding so high a position as the head of such an organization as the Society for the Prevention of Cruelty to Animals treats the subject with such flippant ridicule as is shown by the interview in question, it is time that he was disciplined by the veterinary profession or else be induced to cease such misleading statements for the public mind. To those who place credence in his statements, the absolute disregard for the bite of a dog might result in the progress of the toxæmia produced by the saliva of a rabid animal to a point where nothing could be done of a preventive nature, and a life so sacrificed would be directly dependent upon his mischievous remarks. As evidence of the utter fallacy

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of such a contention we draw attention to a paragraph found in the *New York Medical Journal*, of June 4. Will President Haines please stick a pin in it, and, as his excellent magazine and official organ, *Our Animal Friends*, gathers many items of interest concerning animal diseases, it is quite at liberty to reproduce it in its next issue:

"*Hydrophobia*.—On Thursday, May 26th, a dog bit two children at Thirty-ninth Street and Armour Avenue, Chicago. The director of the laboratory instructed the physician to have the dog tied up and carefully watched. On Friday night the dog died with all the characteristic symptoms of hydrophobia. The animal was brought to the laboratory on Saturday morning and, upon a post-mortem examination, a diagnosis of hydrophobia was verified beyond doubt. This is the second dog in two weeks on which the laboratory has made a diagnosis of hydrophobia. The first one was killed, and it was uncertain as to whether it was hydrophobia. A number of animal experiments had to be made and it took nearly two weeks to arrive at a diagnosis; but the last dog, held according to instructions from the laboratory, died in a few days, and a positive diagnosis was then immediately made without any trouble, and treatment instituted a week earlier than was possible had the dog been killed. Rabies is unusually prevalent throughout the country at present. Seven cases were admitted to hospital in one day recently in the city of Baltimore."

ARMY VETERINARIANS are very much in earnest in their desire to improve their status in the service. No sooner was it known that their petition to the War Department had been placed upon the file of oblivion than two more petitions were gotten under way. In the "Army Veterinary Department" this month one of these documents will be found, with a commentary explaining its provisions. This manifestation of undaunted spirit is very commendable in our military colleagues, and we are just as sanguine of their ultimate success as we are certain of the justice of their demands.

ORIGINAL ARTICLES.

FOWL CHOLERA.

BY ARCHIBALD R. WARD, D. V. M., BERKELEY, CALIFORNIA.

(From *The Laboratory of Veterinary Pathology and Bacteriology, University of California.*)

Although "the cholera" is frequently mentioned in poultry literature, very few opportunities to make a conclusive diagnosis have been afforded American pathologists. Salmon¹ studied a disease in North Carolina that resembled the fowl cholera of Europe, but, owing to the embryonic condition of bacteriological methods of the period (1880), did not present conclusive evidence of the identity of the disease with that of Europe. Moore² obtained sick and dead hens from three outbreaks of a disease called cholera, but the one observed by him was not the true fowl cholera. The name infectious leukæmia has been assigned to the disease by Moore. ³Friedburger and Fröhner, Hayes' translation, use the names fowl cholera and fowl typhoid as synonyms in their description of the disease, commonly known by the first mentioned name. Curtice⁴ has very recently published a bulletin dealing with the disease described by Moore, but calls it fowl typhoid. Higgins⁵ has reported an outbreak of the true cholera in Canada.

Opportunity has not been afforded to students of sanitation for observations upon outbreaks of fowl cholera in America, with trials of sanitary measures. This may be partly charged to the familiar disinclination of owners to disclose the existence of an infectious disease among their stock, and partly to ignorance of the proper quarter to which they could appeal for aid. Consequently the opportunity recently enjoyed to study an extensive outbreak of fowl cholera was regarded as important in affording an opportunity to make a field test of the means necessary for its control. Furthermore, considerable interest surrounds the question of the identity of the disease, on account of the very restricted number of cases in which the existence of

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the true fowl cholera has been proven in America. Some observations upon the nature and methods for the control of the disease are submitted herewith.

Symptoms.—The yellow color of the urates in the droppings is the first noticeable symptom. The discharges frequently cling to the feathers below the vent. Diarrhœa appears later. The character of the dung varies considerably in color and consistency. Sometimes it consists of a pasty, greenish mass, or a brownish red mucus, or a viscous transparent fluid in any case, mixed with yellow urates.

The sick fowl gives evidence of its condition by an unnatural attitude of the feathers, and by a disinclination to move about as usual. None are observed to eat during the later stages of sickness. Thirst is frequently present, for fowls are observed to drink copiously in the advanced stages. A mucous discharge from the mouth is occasionally noticed. Towards the end drowsiness is very marked. The temperature varies from 109°–112° F.

In the majority of cases in which the time of exposure to infection was known, death occurred within three days. Sickness was seldom noticed more than twenty-four hours previous to death. All the cases observed were of the acute type. Observations demonstrated that the disease could sometimes produce death in eighteen hours, including incubation period. The fact that more deaths occurred on the roosts at night than during the day time is noticeable. Some hens were found dead upon the nest.

At death, or some hours previous, the comb is observed to take on a dark purple color, but not always, for often it appears pale and bloodless.

Lesions.—A congestion of the bloodvessels of the liver, kidney, mesentery or intestines is noticeable to some degree in all cases. Punctiform hæmorrhages are found upon the heart with almost absolute uniformity. The liver is very frequently marked with punctiform whitish areas of necrosis. Stained sections show these necrotic foci throughout the substance of

the liver and besides reveal a congestion of the bloodvessels of that organ. The next most striking lesions occur in the first and second duodenal flexures. The mucosa is deeply reddened and studded with extravasations, varying in size, but seldom exceeding one millimeter in diameter. These involve the intestinal coats to an extent that makes them distinctly visible on the peritoneal surface. The contents of the duodenum consist of a pasty mass, more or less thickly intermingled with blood clots. The intestinal contents sometimes consist of a cream colored pasty mass, or may be brownish red or even green in color. Lesions are very rarely observed in other portions of the intestines. The ureters are noticeable in practically all cases by reason of the yellow colored urates that they contain. The nasal cavity, pharynx and oral cavity frequently contain a viscous mucus, probably regurgitated from the crop.

The field notes on twenty-one post-mortem examinations reveal reference to the hæmorrhages upon the heart in twenty-one cases; punctiform necroses of liver, fifteen cases; hæmorrhages in duodenum, seven cases, and discoloration of skin in six cases. The presence of a gelatinous exudate within the pericardium was noted twice. A fibrous exudate in the pericardium occurred the same number of times. Hæmorrhages in the peritoneum other than those visible through the mucosa of the duodenum occurred but twice. In one case hæmorrhages were abundantly scattered throughout the muscles of the trunk and legs.

Two turkeys fell victims to the disease. The symptoms and lesions did not differ markedly from those in hens. Notes on these cases are submitted.

October 14.—Hen turkey observed to be sick. Temperature about two hours before death, $112\frac{3}{5}^{\circ}$ F. No reddening of skin. Heart muscle contains some punctiform hæmorrhages. The cæca, mesentery and intestine are covered with a yellowish fibrinous exudate. The intestines contain dark, pasty fæces. The vessels on the peritoneal surface of the gizzard are hyperæmic. The lungs, proventriculus, intestines, kidneys and spleen are not visibly altered.

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* Details

October 14.—Gobbler, found soon after death. No discoloration of skin. Lungs are congested and dark red in color. The dorsal aspect of the lungs is covered with a gelatinous exudate, which liquefies upon exposure. The œsophagus and crop are normal. The proventriculus contains a greenish, transparent gelatinous substance mixed with blood clots. The gizzard contains a few blood clots. The mucosa of the intestines, as far as the cæca, is congested. The duodenum contains yellowish, pasty mucus with occasional clots of blood. The cæca are distended with material of normal appearance. Vessels of peritoneal surface of the duodenum and of mesentery are congested.

Etiology.—Culture media implanted from the liver, spleen, kidneys and heart blood of fowls and turkeys yielded cultures of a bacterium possessing the characteristics of the *bacterium septicæmiæ hæmorrhagicæ* group, a fact of importance in definitely establishing a diagnosis.

Fowls inoculated with cultures, by ingestion, subcutaneous or intravenous inoculation, died in from one to three days, with symptoms and lesions similar to the naturally infected cases. The organism was shown to be pathogenic to rabbits, guinea-pigs and pigeons.

Blood Counts.—In comparing the lesions of infectious leukaemia and fowl cholera, Moore⁷ has pointed out the desirability of a study of the blood in the latter disease. Consequently advantage was taken of the opportunity to make blood counts as tabulated below.

TABLE I.

Blood counts of fowls infected by ingestion and infected naturally.*

Fowl.	White.	Red.	Remarks.	Temperature.
No. 3,	23,000	2,290,000	3 days after exposure to infection.	112 $\frac{3}{8}$
" 3,	20,000	2,800,000	4 " " "	110 $\frac{3}{8}$
" 6,	37,000	3,930,000	3 " " "	110
" 8,	87,000	4,490,000	3 " " "	109
" 8,	101,000	2,960,000	4 " " "	108
A,	58,000	1,710,000	Naturally infected.	109
B,	45,000	1,925,000	" "	

* Details of the methods of infecting these fowls are given on page 332.

TABLE II.

Blood counts of apparently healthy fowls.

Fowl.	White.	Red.
No. 11,	24,000	2,980,000
" 12,	26,300	2,987,000
" 14,	36,000	3,115,000
" 15,	52,000	3,980,000
" 16,	61,000	3,920,000
" 17,	30,000	2,380,000
" 18,	24,000	3,620,000

In the case of No. 8, a marked diminution of the red corpuscles and the increase of the white corpuscles is noticeable. A comparison of the counts of fowl A and B with three normal counts, would lead to the conclusion that a decrease of red corpuscles occurs in cases of natural infection.

TABLE III.

Changes in the blood counts of fowls inoculated with cultures of the fowl cholera organism.

Fowl.	White.	Red.	Remarks.	Temperature.
No. 11,	24,000	2,980,000	Healthy fowl, 23 hrs. after inoculation,	108 $\frac{1}{5}$
" 11,	19,000	3,380,000	Died 2 hrs. later.	111
" 12,	26,300	2,987,000	Healthy fowl, 24 hrs. after inoculation,	108 $\frac{1}{5}$
" 12,	27,000	3,500,000	Died next day.	108 $\frac{1}{5}$
" 13,	129,000	3,300,000	Before inoculation.	108 $\frac{1}{5}$
" 13,	142,000	3,310,000	24 hrs. after inoculation. Died following day. Post- mortem showed tubercu- losis and cholera.	107 $\frac{2}{5}$ 108 $\frac{2}{5}$
" 13,	257,000	3,046,000		
" 14,	36,000	3,115,000	Healthy fowl. Inoculated, but died before next day.	109
" 16,	61,000	3,920,000	Before inoculation.	
" 16,	15,000	1,880,000	36 hrs. after inoculation, Died night following.	
" 17,	30,000	2,380,000	Before inoculation.	
" 17,	22,750	1,590,000	36 hrs. after inoculation.	
" 17,	14,500	1,700,000	48 hrs. after inoculation.	

The figures for Nos. 11 and 12 reveal no marked change in the relative number of corpuscles during the short course run by the disease in these cases. No. 13 shows a marked leucocytosis in avian tuberculosis, increased by infection with cholera without disturbance of the numbers of red corpuscles. No other fowl in the list showed lesions of tuberculosis or other disease, upon post-mortem examination. Nos. 16 and 17 show distinct decrease of both classes of corpuscles. Fowls 8, A, B, 16 and 17, furnish evidence that a marked diminution of red corpuscles may occur. This fact accounts for the pale appearance of the blood commented upon by some observers.

In all cases Toisson's fluid was used for diluting in the pipette. During the counting there were noted bodies, resembling the red corpuscles, but somewhat smaller, and unlike them, stained blue. They occurred singly sometimes, but more often in clusters, which fact occasioned some embarrassment during the leucocyte counts. They occur both in normal and pathological blood. In mounted specimens of fresh blood they occur in clusters and show a refractive with sharply-defined border, surrounded by cytoplasm with an ill-defined border. The protoplasm is deficient in amount as compared with the red corpuscles, and among the clusters apparently free nuclei are observed. With the Wright Jenner stain the nuclei behave like those of leucocytes, while the protoplasm takes on a pale blue color. The cells quite closely resemble those of the red corpuscles, except that some are more narrow and others smaller.

Moore⁶ has mentioned the fact of red corpuscles staining in Toisson fluid. Under the designation of red corpuscles, he has pictured cells morphologically identical with those just described. The present writer has regarded the bodies in question as atypical red corpuscles and has ignored them in the blood counts. In one specimen of pathological blood in which the writer fancied that they were more numerous than in normal blood, they were counted with great difficulty. In this instance 400 squares were gone over and the conclusion reached that the sample con-

tained 54,000 per cmm. Phagocytosis in specimens of mounted fresh blood was not observed.

Conditions Surrounding Outbreak.—The poultry ranch upon which the disease was found was stocked with about 3,000 fowls, distributed over several hundred acres of land in colonies containing about 175 fowls each. Each colony was supplied with two roosting houses, a laying house, grain feeding hopper, feeding troughs and drinking water fountain. The several colonies were near enough together so that the hens venturing farthest abroad during the day would intermingle with those from other colonies, a fact of significance in relation to the spread of the disease. Hens have been observed to go several colonies from home, attracted by the feed in the wagon from which the daily rations were distributed.

The introduction of the disease among the fowls could be readily understood, for a neighbor on an adjoining ranch had lost 2700 fowls during the months of July, August and September just preceding. Other neighbors had suffered severe losses. The outbreak of the disease was brought to notice by 12 dead hens found under the roosts one morning. On the second day as many more were found, after which deaths practically ceased for a week, when losses again occurred at the rate of six to ten a day. In three weeks from the start the disease had spread to four adjoining colonies, the total number of deaths for that time being about 100. The owner became thoroughly alarmed at this juncture and appealed to the Agricultural Experiment Station for advice.

Preventive Measures.—A survey of the situation revealed many grave defects in the sanitation. Measures designed to control the various sources of infection were put into operation as promptly as circumstances indicated the necessity for them. No information was available concerning the relative importance of the various possible sources of infection. Consequently the preventive measures were experimental in nature to a certain extent and were elaborated somewhat from time to time. Table V on page 334 shows the date of inauguration of the va-

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rious measures, with their effect upon the death rate. The dead fowls, in many cases, were partially consumed by the survivors owing to the delay in collecting the dead. The serious importance of the eating of the dead is illustrated by an experiment performed with a view of determining the length of time elapsing between exposure to infection and death. Ten cockrels were selected from a colony on the ranch that was free from disease and as subsequently events proved, remained free during the outbreak. All were placed in a crate and were allowed to eat freely of the entrails and flesh of a fowl dead of the cholera. The dates of death are recorded in the following table:

TABLE IV.

Deaths after eating infectious material.

Fed viscera of dead fowls:		Oct. 11.	12,	13,	14,	15,	16,	17,
Number	1,		Died					
"	2,			Died				
"	3,							Died
"	4,			Died				
"	5,		Died					
"	6,					Died		
"	7,			Died				
"	8,						Died	
"	9,				Died			
"	10,		Died					

As each one died an examination of the internal organs was made, and conditions were found identical with cases that contracted the disease naturally. The experiment shows that the disease is very rapidly fatal, a large percentage dying within three days after exposure. The results demonstrate most emphatically the necessity for the immediate disposal of dead fowls to prevent the infection of other fowls by eating their carcasses.

The practice of slaughtering all hens sick of the cholera was inaugurated immediately but, as the disease was noticeable for only a short time before death, many had the opportunity to spread infection before detection.

On October 17th, (see table) it was decided to kill every hen that showed the slightest symptoms of any sort of disease. It

was found very desirable to visit the roosting houses at day-break, for at that time the sick ones are almost certain to be found lingering in the houses. The early visit also permitted the collection of the dead before the living could become infected by eating portions of them.

The dead were burned or buried deeply as convenient. Scrupulous care was exercised to dispose of the dead before the living fowls could molest them.

The fowls were fed from open troughs or from the ground which permitted contamination of the feed directly by droppings or by material tracked in from the roosting houses. The undesirable method of feeding was discontinued. Troughs were made so as to permit the fowls to reach the head in, but to prevent the feet from coming in contact with feed.

On account of the danger to the fowls from the contaminated ground about the houses, the five infected colonies were moved to another part of the ranch.

It was deemed necessary to spray all the poultry houses on the ranch, both for disinfecting and for minimizing the number of parasites that might be instrumental in spreading infection.

A disinfecting solution recommended by Laplace was selected for spraying the roosting and laying houses. Dr. D. E. Salmon describes its preparation in Farmers' Bulletin No. 24, U. S. Department of Agriculture, as follows :

Crude carbolic acid : $\frac{1}{2}$ gallon.

Crude sulphuric acid : $\frac{1}{2}$ gallon.

"These two substances should be mixed in tubs or glass vessels. The sulphuric acid is very slowly added to the carbolic acid. During mixing a large amount of heat is developed. The disinfecting power is heightened if the amount of heat is kept down by placing the tub or demijohn containing the carbolic acid in cold water, while the sulphuric acid is being added. The resulting mixture is added to water in the ratio of 1 to 20. One gallon of mixed acid will thus furnish 20 gallons of a strong disinfecting solution, having a slightly milky appearance."

A small bucket spray pump was used to apply the disinfectant. The spraying outfit, together with a barrel of the disinfectant were moved on a sled from one colony to another. The liquid was sprayed upon the floor, sidewalks and perches of the roosting houses, and upon the floor and side walls up to the nests in the egg houses. The ground was sprayed for several feet around the houses. Special care was paid to the shady side where the chickens spent considerable time during the day. The infected colonies were all sprayed daily from the 9th to the 15th of October, inclusive. All the other colonies were sprayed daily, except Sunday.

The mixture was found undesirable for continued use, because of the irritation caused by inhaling the spray, and because of the corrosive effect of the sulphuric acid upon the hands, clothing and rubber hose. Crude carbolic acid alone would not mix with the water, but a mixture of 5 per cent. each of crude carbolic acid and phenolene was more satisfactory. This was used till November 5th, when work was discontinued. The cost of materials for spraying sixty houses a day was \$1.10. The labor required to spray the sixty houses each day consumed four hours' time for two men and a team.

The roosting houses were cleaned once a week and the manure was placed in a part of the ranch where there would be no possibility for it to contribute to the spread of the disease.

A number of fowls among those frequenting the vicinity of the house and barns were lost from the cholera. Two turkeys also died within a few hours after they were first noticed to be sick. These birds had abundant opportunity to catch the disease from sick and dead ones brought from the infected colonies. The few fowls about the house were caught and placed with one of the infected colonies.

On October 20th, it was deemed necessary to place some disinfectant in the drinking water and thus ensure freedom from danger of communicating the disease by this means. It was decided to use corrosive sublimate in the drinking water of the infected colonies, as suggested by Ritzer.⁸ There was

some fear that it would have an undesirable effect upon the egg yield, if no worse would result. Stoneware drinking fountains were used because the corrosive sublimate would have combined chemically with the metal drinking fountains in common use. For convenience in making up the solution of the proper strength, corrosive sublimate in the form of Compressed Antiseptic Tablets, prepared by John Wyeth & Bro., were used. The tablets contain such an amount of corrosive sublimate that one tablet in a pint of water makes a 1 to 1000 solution, making the preparation of a solution of any weaker strength a simple matter.

The sublimate was used for about two weeks, and for most of the time a 1 to 2000 solution was made up. No injurious effects were noted. A decrease in the egg yield may possibly have been due to its use.

The control of the drinking water of the fowls is a comparatively simple matter in the dry season. An outbreak in wet weather would present much more serious difficulties, for every puddle of water on the ground is more than liable to be contaminated from the droppings. Under such conditions fowls would catch the disease much more readily.

No suggestions were made regarding the character of the feed to be supplied, as that matter was regarded as having no serious bearing upon the problem.

TABLE V.

Effect of preventive measures upon death rate.

Date.	Deaths from cholera, including those killed.
Sept. 17. Disease first appeared in one colony.	
Oct. 7. Now involves five colonies. Total deaths to date about	100
8.	48
9. Began spraying daily and killing sick	22
10.	34
11.	26
12.	18
13.	10

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14.	Moved infected colony	10
15.	Sanitary feeding troughs first used	10
16.	?
17.	Corrosive sublimate first used in drinking water	12*
18.	. . . . .	10*
19.	. . . . .	6*
20.	. . . . .	7
21.	. . . . .	2
22.	. . . . .	7
23.	. . . . .	4
24.	. . . . .	4
25.	. . . . .	3
26.	. . . . .	2
27.	. . . . .	2
28.	. . . . .	1
29.	. . . . .	4
30.	. . . . .	1
31.	. . . . .	3
Nov. 1.	. . . . .	0
2.	. . . . .	0
3.	. . . . .	3
4.	. . . . .	0
5.	Stopped sublimate in water. Stopped spraying	
	Total	349
	Since beginning preventive measures	201

A study of the daily death rate in its relation to sanitary measures brings out the fact of the efficiency of merely destroying the sick and disinfecting thoroughly. These measures alone were enforced until the daily death rate dropped to 10. It would be unsafe to draw conclusions concerning the actual benefit of the use of corrosive sublimate, for during its use extreme vigilance was exercised to weed out sick fowls. Moreover, its use was commenced about the time when the beneficial effect of disinfection might be expected to become evident.

*The numbers here reported refer to the fowls that died of the cholera. On the same days 55 fowls, scattered over the whole ranch, were killed by the owner because noticeably sick from some disease not determined. As roup was prevalent among fowls at the time there is good reason to believe that but a small percentage of those killed had the cholera.

The supervision of the epizootic was discontinued on November 5th, but the owner was advised to disinfect occasionally afterwards and to continue doing so actively if necessity arose. Nothing was done, however, and enquiry afterwards disclosed the fact that about 25 fowls died in December. Occasional deaths occurred until April 1st, when about 50 died during forty-eight hours. This aroused the owner from his dream of fancied security and at the time of the present writing he has determined to dispose of every fowl in the infected colonies.

Dissemination of Infection.—The spread of the disease across the country has been the subject of some speculation. The evidence indicates that the movement of fowls is one of the important causes of the introduction of the cholera into flocks where it was hitherto unknown. The ranch upon which the foregoing observations were made appears to have become infected from an adjoining ranch where the disease existed, for the trouble first appeared in a colony nearest to the second ranch and where fowls could readily intermingle. A third ranch adjacent to both of these had been stocked with fowls purchased in a locality several miles distant where cholera was known to have been seriously prevalent.

The possible importance of pigeons and wild birds as a means of spreading contagion is worthy of consideration. The fact that pigeons contract the disease has been mentioned on page 327. Other writers have shown that the disease attacks some wild birds.

The practice of throwing dead fowls by the roadside is an important means of distributing the cholera. When the disease breaks out it is a common practice of poultrymen to crate their fowls and take them to market. Not infrequently fowls die during the trip to the shipping point and are thrown out by the driver to conceal the fact. Should this be done in front of a poultry ranch it is very liable to result in the further spread of the disease, for fowls eagerly eat the dead ones. The presence of hens dead of the cholera along the roadside is a matter of common observation. Two instances of the infection of poultry

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ranches, from dead fowls thrown by the roadside, have been reported in the present expizoötic. In both instances outbreaks involving serious losses have resulted. This practice is prohibited by legislation in the county in question, but it is practically impossible to secure evidence to convict the offenders.

One case of the introduction of infection through the medium of dead hens floating down the stream, has come to notice. Some dead fowls were pulled on shore by skunks, partly eaten by them and later cleaned to the bone by fowls from a nearby colony. Fifty-eight fowls died during a period of twenty-four hours. Over 100 died before the owner disposed of the remainder of the colony, after which no further trouble was experienced on the ranch.

The experience of another poultryman in the neighborhood furnished information worthy of record. After having his stock of fowls depleted by the ravages of the disease, he determined to replace the losses by purchase of healthy fowls. As the disease existed in practically every colony at the time, the problem of introducing fresh stock was a serious one. The owner decided to make the attempt in a field containing three colonies in which 870 fowls had been lost out of 1350 originally there. The survivors were removed to other colonies on the ranch. The houses of the three colonies were cleaned, whitewashed, and the floors sprinkled with phenolene. Each of the groups of houses was moved about two hundred yards from its former location, and was left untenanted for two weeks. Nine hundred and fifty fowls were then distributed among the houses, and no disease appeared among them. That this field in question was quite isolated from other infected colonies is believed to be another factor that contributed to the happy result.

Examples of severe losses from fowl cholera through ignorance of sanitary measures, lax enforcement of them or skepticism as to their value could be readily cited. An enumeration of them would accomplish no purpose, other than to emphasize the importance of a better knowledge of sanitation on the part of those engaged in the poultry industry.

This need has been recognized by the more progressive California poultrymen, who secured the passage by the last Legislature of an act establishing the California Poultry Experiment Station at Petaluma, and providing \$5000 for its use during two years. As defined by law: "The purpose of said station shall be the study of the diseases of poultry to ascertain the causes of such diseases, and to recommend treatment for the prevention and cure of the same; to ascertain the relative value of poultry foods for the production of flesh, fat, eggs and feathers; to recommend methods of sanitation, and to conduct investigations for the purpose of securing results conducive to the promotion of the poultry interests in the State. This Act shall be liberally construed to the end that the station hereby established may at all times contribute to the technical and general knowledge of the public upon the subject of poultry husbandry.

"Sec. 3. The said station shall be under the supervision of the Director of the Agricultural Experiment Stations of the State of California, who shall, from time to time cause to be issued bulletins of information regarding the care of poultry.

ACKNOWLEDGMENT.

Mr. H. O. Woodworth, foreman of the California Poultry Experiment Station of Petaluma, rendered efficient aid in carrying out the sanitary measures and in collecting data regarding disinfection.

Mr. L. B. Chandler, student, made the blood counts of fowls Nos. 11 to 15 inclusive.

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THE veterinarian who from circumstances is prevented from attending the St. Louis meeting of the A. V. M. A., is entitled to sympathy; while he who refrains from joining his brethren in the great feast of knowledge from choice, is to be pitied.

THE railroad rates to St. Louis in August will be ridiculously low; the character of the great veterinary event scheduled for that month in that city will be exceptionally high. With two such inducements, who will remain away from the veterinary mecca of 1904?

POISONING DOGS WITH FRIED SPONGE.—Residents of Bath Beach who own valuable dogs have complained to the police that dog poisoners are at work in that suburb, and rewards have been offered for their apprehension. Tuesday Martin Julian, a brother-in-law of "Bob" Fitzsimmons, reported the death of his St. Bernard Sax, to which had been given a dose of hashed glass. Julian lives in Nineteenth Avenue, near Benson Avenue. Two dogs owned by near neighbors of his have since died. They were also St. Bernards and were owned by Mrs. M. Levy, of Nineteenth Avenue, and Dr. Philip C. Finn, a veterinary surgeon, who lives in Eighteenth Avenue. Mrs. Levy's dog died of some irritant poison. Dr. Finn performed an autopsy on the body of his dog and found that he had been given a fried sponge. A good sized sponge, fried in lard, will shrink to the size of a walnut and is easily swallowed. When the grease is dissolved by the acids of stomach the sponge resumes its normal size and lodges in the intestines, causing a painful and lingering illness, which results in death. Dr. Finn's dog suffered five days before it died. In all eight dogs have met similar deaths in Bath Beach and Bensonhurst within two weeks.—(*New York Herald*, June 23.)

HEROIC TREATMENT.

BY I. A. RUBY, V. S., PLYMOUTH, OHIO.

Read before the Annual Meeting of the Ohio State Veterinary Medical Association,
Jan. 13, 1904.

By this term we mean extraordinary treatment, or any departure from that line which would, in a regular way, be prescribed. It may, in a veterinary sense, be regarded as a contempt of danger, not from ignorance or inconsideration of the gravity of the case, but from a noble devotion to the profession which we have espoused, and a just confidence of being able to meet successfully the exigencies of each special case as it may appear.

There are many conditions and circumstances which often cause ordinary means to fail; the most common of which is the late hour at which the veterinarian is called. The visit is too often unsatisfactory to both the owner and the doctor. The owner very often defers the call until nearly every chance of recovery has passed, then suddenly he is seized by a desire to have a veterinarian immediately, and he expects you to drive your horse to death and perform a miracle on his. Some years ago I inserted in my business card, "If you desire my services, call me in time; I can't raise the dead." After examining the neglected case, you may note certain conditions which tell you plainly that something more than the ordinary must be done, or perhaps they may tell you that nothing available *can* be done. The more fortunate of these cases may be saved by heroic measures.

It may not be in strict conformity with the subject, but I would like to know how to dispose of those cases which give no grounds for hope of successful treatment. It appears quite as important, in some cases, to give the owner's mind a little treatment, as it is to administer to the patient; and you may have to resort to *heroic* measures to *satisfy* him. Some men will be satisfied when you inform them that the animal will die, and bid them "good day." The next man may always

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harbor the thought that something might have been done, and perhaps if medicine had been left, the echo would have been, "He ought to have seen that the animal was about to die." Study the man as well as the patient; and if you see no hope, and he cannot give up the case, tell him: "I have no hope of recovery in this case, but if you think the days of miracles are not past, here is some medicine; give a dose every hour until you see that all hope is gone." There are many conditions which may interfere with the action of medicine. Some of them may be accounted for, but in view of our present limited knowledge of the laws and intricate relationship existing among the different systems of the animal economy, and indeed among the various parts of the same system, we may not be able to account for the failure. Many times have you faithfully administered medicine to your patient, until you have exhausted all ordinary means, without seeing the physiological action of a single drug. As before stated, we may, or may not, be able to account for the failure. In some cases it may be the result of inability to absorb medicine, in consequence of partial or complete paralysis of the absorbing glands in the walls of the stomach and bowels. The causes which may give rise to this condition are, in many cases, so occult, so complicated, and so little understood, that they are as far beyond the comprehension of the writer as they are beyond the province of this paper.

Some cases in which there is no response to the exhibition of medicine, may be accounted for by lack of peristaltic action, in which case at least a portion of the medicine is lost in the ingesta, and either never comes in contact with the mucous membrane or does so so tardily that its united or full action is never obtained. There are conditions in which it would seem almost impossible to poison an animal unless by means of some powerful irritant or corrosive element. The text-books on materia medica and therapeutics, as well as the lectures and general instructions given in the various veterinary colleges, are as mere pointers or guide-boards, giving the general direction along which the pathway of the practitioner leads; but, like the guide-

boards on the public highway, they never conduct you along the journey, and do not always tell the truth as to distance. We may take counsel of each other occasionally, as we are doing to-day, but in the main we must travel independently. There are times when each veterinarian must become a law unto himself. If he be truly a doctor, he should be able to cut loose from all formulæ and prescribed methods, when the peculiar features or complications of the case demand it, and on his own responsibility make the treatment fit the case. There are three classes of veterinarians. The first of these includes the over-cautious, who, fearing deep water, paddle along the shore. They never venture beyond the treatment regularly mapped out, and occasionally from lack of surgical interference or heroic medicinal treatment, as the case may be, the patient is lost. The second class embraces those who lack caution and possess a surplus of boldness which merges into recklessness. They are likely to be in haste, both surgically and medicinally, in resorting to heroic measures which incur loss to the owner, and bring an unenviable reputation to the profession and to himself individually. The third class is made up of those who possess the happy combination of caution and boldness. They are the reliable men. They are the successful practitioners. To this class the veterinary profession will always be in debt. These are the men who will come to the surface in cases of emergency. When a sleeping bull-dog is lying in the path and there is plenty of room, they will cautiously pass by, but if necessary they will not hesitate to club him out of the way. In practice, when their judgment dictates it, they will not hesitate to use the knife apparently unmercifully, or to administer medicine with such profligacy that it might, by the cautious class, be called "unreasonable treatment" rather than "heroic treatment." In veterinary practice, heroic measures are not as frequently resorted to, as far as surgery is concerned, as in human practice, in which the factor of highest importance is the prolongation of life. Before resorting to any operations which properly might be called heroic, several conditions should be considered, viz. :

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Is there sure loss of life on one side, and at least a chance for recovery on the other? What is the animal worth in its present condition? What will be the probable value after recovery, allowing a good discount for the chance of entire loss?

Along with some other questions which might pass through your own mind silently, or be discussed at length with the owner, are two, which your interest in the case might cause you to forget, viz. : What can I reasonably charge as a fee for this operation? And will I get the cash? Another fact to be remembered is that a good strong, lame, or blemished horse is worth much more than several dead ones, especially if you are at a remote distance from a fertilizer factory. We are justified in the heroic administration of medicine when we observe insusceptibility to its action, and the matter should not be delayed until the patient is ready to cross the "dead line."

In closing this paper, I trust you will overlook all appearances of *ego*, while I refer to a few cases in connection with my experience as a veterinarian, and I must say that I have never had occasion to regret the fact that in certain cases I have resorted to heroic treatment; for, with the exception of a few cases which were purely experimental, I have always been pleased with the results. I desire to say further that I do not wish to be considered an extremeist, but that I shall reserve the right to meet extreme cases with extreme measures, and I shall now take the risk of being, in your opinion, placed in the second class of veterinarians above named, and I shall also risk the tension placed upon your credulity as well as your patience while I report a few cases in which I used heroic treatment.

In the summer of 1893, was called to visit a colt, two months old, suffering from violent spasmodic contractions of the bowels; cause, unknown. In the face of all ordinary anodyne and antispasmodic agencies, the case grew worse, until in my desperation I determined to bring about some kind of a *quietus*. I began giving morphine in three-grain doses every ten minutes, and continued until fifteen grains had been given, at which time, some signs of relaxation were shown. All medicine was

now stopped, the colt became quiet; the effect of the drug passed off, the colt got up, took nourishment and remained well.

The next case I wish to report was that of a mare choked with oats. 'The case was of several hours' standing. The bolus was located in the middle third of the œsophagus. On account of the nervous disposition of the animal, it was impossible to use any mucilaginous or oleatic substances, and I plunged a small trocar through the integument and wall of the œsophagus, into the mass of oats, and proceeded to pump a few ounces of linseed oil through the canula. This was followed by gentle manipulation and the prompt disappearance of the choke. I have repeatedly done this in obstinate cases of cervical choke. In one very bad case of choking in the thoracic region, I gave a heroic dose of Fleming's tincture of aconite, which was closely followed by relief. Did this happen to be the case or was it due to the relaxing effect on the muscular tissues in the walls of the œsophagus?

The next case was of a cow that stripped her halter, and, after eating a large quantity of grain, passed out and finished her feast by appropriating a quantity of dead grass and frozen wheat. I found her after night, not able to arise. Not wishing to perform rumenotomy with insufficient light, a heroic dose of sulphate of magnesia, ginger, alcoholic stimulants and strychnine was given. When seen next day there was some promise of a response, and by reënforcing the treatment the cow recovered.

The next case to which I call attention was a cow, due to calve in four days, which stole a half barrel of bran. The symptoms need not be portrayed. You can see her without much stretch of your imagination. Here was a case for heroic treatment. The owner was told that the cow would be unloaded without respect to the fate of the fœtus. A tremendous dose of sulphate of magnesia, gamboge, ginger, oleum lini and fluid extract of nux vomica was given, and next day there was a second deluge not recorded until this day. The contents of both abdominal and pelvic cavities were disgorged, with the

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exception of the placenta, which was removed mechanically. The cow and calf both lived.

My fellow-practitioners, do not charge me with being addicted to the *habit* of using "shot gun" doses, but I wish to report one more case of heroic treatment.

Mr. Lockhart, south of Bellville, Ohio, the owner of a fine herd of dairy cows, called me to see a large fine Holstein cow. The rumen was found to be impacted, circulation very weak, great nervous prostration, and entire cessation of peristalsis. Now, for the treatment: I gave this cow at one dose, two and one-half pounds of sulphate of magnesia, one quart of linseed oil, gamboge one ounce, soluble ginger one ounce, strychnine seven grains, and left diffusible stimulants to be given every two hours. An examination next day showed slight improvement in every way, excepting that there was no evacuation of solids. I now proceeded to repeat the dose formerly given, with the addition of one gallon of molasses. This whole mass of medicine failed to purge the cow, but we got sufficient action to gradually unload the clover chaff. The cow recovered, my health is excellent, and the dairyman is still prospering.

THE feeding of the dogs at the Ladies' Kennel Association Show held at Mineola, L. I., June 22-23, was entrusted to Spratt's Patent.

It is prophesied that there will be a greater increase in membership at St. Louis than ever before. It will be only a short time when the thousand mark will be reached. It should have been there long ago.

WAR ON RANGE DISEASES.—Range reports show that sheep scab has been all but suppressed, the vigorous dipping campaign inaugurated by the Department of Animal Industry having proved effective. The pending campaign is for the eradication of mange, which even now threatens the herds of the trans-Missouri country. Veterinarians are confident that range bovine and ovine diseases can be easily suppressed; in fact, there can be no reason advanced why they should exist. The dipping vat is a panacea beyond all doubt.—(*Live-stock World*.)

SOME FACTS CONCERNING METABOLISM.

BY DR. W. A. STUHR, AMES, IOWA.

A Paper presented to the Annual Meeting of the Iowa Veterinary Medical Association,
1904.

It is with signal pride that I appear before you to-day, in this capacity. I say pride because that, and that only, must necessarily be the feeling of us all, as veterinarians, when we think of the rapid progress that our profession has made in the past few years, and, indeed, the enviable position that it is fast assuming among other professions. It is only of recent date that we have received National recognition, and now the rapid enactment of laws in the various States regulating the practice of veterinary medicine, can only serve to bring the profession into further prominence. Indeed, at the present time the veterinary profession is regarded in the light of guardian to the vast stock-raising industry of the world, as well as being almost indispensable to the health and happiness of mankind.

When, at first, I was asked by your worthy Secretary to prepare a report or paper for this meeting, I was at a loss to know what to present. Inasmuch as I have not experienced anything extraordinary in the line of cases, or anything which might prove of peculiar interest, I have decided to present some facts concerning what I believe to be, for many reasons, one of the most interesting of the vital phenomena of the animal body, hoping that in so doing we might receive some mutual benefit. The subject that I have selected for this discussion is fully as obscure as it is interesting, and the few facts that we do possess have been gleaned from a close scrutiny of causes and effects, the process itself being entirely beyond the light of our present knowledge.

Metabolism as best defined signifies the change produced in a substance by the action of living cells upon it, or the process by which living cells or organisms incorporate matters obtained from the food, into a part of their own bodies. The law of nutrition or assimilation, which perhaps is one of the most funda-

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mental to characterize the organized from unorganized matter, is entirely dependent upon the process of metabolism for its identity, for it is through these changes, that unorganized matter is converted into living tissue. Thus the importance of the study of this vital phenomenon readily becomes apparent.

Metabolism in its broadest sense signifies the entire series of changes through which dead matter must pass before being converted into living tissue. It therefore includes digestion, absorption, excretion, and respiration, through which both food and oxygen are prepared for the activity of the living molecules, and the products of excretion are removed from the system. It may be said that many attempts have been made to reduce the manifestations of these interesting phenomena to the ordinary physical and chemical laws, but the success of these efforts have been only partial. It is true that with the physical laws of imbibition, osmosis, capillarity, filtration, etc., possibly assisted by chemical affinity, we are able to trace the manner in which the products of digestion find their way into the interior of the cell, and the waste products of the cell activity leave it to be excreted from the system, but the actual forces concerned in the conversion of dead material of a dissimilar character into living protoplasm identical with that which makes up the substance of the cell itself, and the breaking down of the protoplasm with the products of excretion, are as yet not capable of being explained. Thus we see that the whole cycle of changes which we designate under the term metabolism resolves itself into two distinct processes, viz.: that of construction or assimilation, which is termed anabolism, and that of destruction or dissimulation, which receives the name of katabolism. Both of these changes are of a chemical nature of a complex form, assisted probably by some force which at present may well be called a vital force. This term, perhaps, has been dropped from the vocabularies of modern thinkers, but its significance is only clothed in other words.

The primary tendency of protoplasm is katabolic, for which statement there is sufficient proof in the waste products contin-

ually being excreted from the system, such as carbon dioxide, water, urea, and other allied compounds, such as kreatin, kreatinin, etc. The relation existing between the proteid decomposition and urea has been so well established that we now consider the amount of urea excreted from the system in the urine as a direct indication of the amount of tissue change taking place in the body.

These building up and tearing down processes are necessarily very intimately associated, and constitute a series of changes which occur with almost equal regularity, so long as the tissues retain life. The amount and character of these changes may be greatly modified by external influences, and these we may manipulate in such a manner as to favor the end which we wish to accomplish. However, with the exception of these few slight temporary modifications, we may say that metabolism is entirely controlled by the law of development; that is to say, metabolism is self-limiting, or, in other words, is determined by age. In youth, or during the period of growth, the anabolic processes exceed the katabolic tendency of the protoplasm, and consequently the body grows and develops; in middle age, we reach a period at which these forces are at an equilibrium, and following this, the period of decline, where the latter force is greater than the former, which becomes less and less adequate to supply the needs of tissue repair, and consequently the end of life's cycle is reached.

Probably the direct governing influence of metabolism is to be found in the nervous system. Experiment and observation have shown that profound changes in the nature of the metabolism of a tissue may be inaugurated through interference with its trophic nerve supply. Numerous illustrations readily suggest themselves, and I may simply mention as an example the extreme rapidity with which bed sores develop, following the appearance of some spinal or cerebral lesion. Rapid atrophy out of all proportion to the lack of use following an injury to a nerve.

As before stated, there are numerous external conditions

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which exert a marked influence on metabolism, either by increasing or decreasing its amount. Among these influences I may mention prominently, light, temperature, moisture, supply of oxygen, exercise, nature of the food, etc. Heredity, mental excitement, environment also exert a positive influence, but less obscure perhaps than those mentioned.

It is a notable fact that solar light exerts a profound influence over protoplasmic movement. The observations so commonly made upon plants and animals that have been kept in the dark are familiar illustrations of this fact. They become phlegmatic, their protoplasm sluggish, and in animals the excretory products are greatly decreased in amount. Experiment upon hibernating animals shows that by exposing them to the sunlight the amount of carbon dioxid excreted is increased, even after the lungs have been removed, the amount of increase in the sunlight above that excreted in darkness being represented by the ratio 100-93. The total absence of light will entirely arrest the movement of protoplasm, while its presence stimulates contraction. Thus we see that absence from direct sunlight is conducive to increase in weight by lessening the protoplasmic movements, and hence metabolism, but on the other hand, for the same reason, it markedly lowers the vitality of the individual, thus renders him more susceptible to deleterious influences, and permits disease to spread more rapidly under such conditions. The fact that darkness favors the growth of bacteria, has long been established, and, indeed, the intimate association of dark places of habitation and disease is almost proverbial.

Closely associated with light in its effect upon metabolism is the supply of oxygen. Just as it is impossible to have protoplasmic movement in utter darkness, so is it effectually stopped by the lack of oxygen. The supply of oxygen most favorable to the greatest activity of protoplasm is that of normal atmosphere. A medium richer, as well as one poorer in oxygen than the normal atmosphere under normal condition, exerts an inhibitory influence upon metabolism, the degree of inhibition de-

pending upon the extent of variation from the normal oxygen percentage of atmosphere. Thus metabolism may be controlled by a total absence of oxygen, or by a superabundance of it. That is, an atmosphere of pure oxygen is equally as obnoxious as any foreign gas, but fortunately, under natural conditions, this never prevails. It is, however, only the deficiency in oxygen which concerns us, for that possibly occurs only too frequently, and can be remedied by extremely simple measures.

The influence of temperature upon metabolism is not so prominent as at first would probably be supposed. Protoplasm has an upper and a lower limit of temperature, beyond which it ceases to contract, the degree of contraction between these points increasing directly as the temperature rises from the lowest to the highest point. Thus, by regulating the temperature, we may arrive at a point where the protoplasm is most active, or, on the other hand, where it is almost at a standstill. When, however, the external temperature falls to such a point that shivering is produced, metabolism is increased, probably through stimulation reflexly of the motor nerves supplying the muscles. A high internal temperature, such as probably occurs only under abnormal conditions, and which is designated as fever, undoubtedly greatly increases metabolism, as can be ascertained from the vast increase in the amount of carbon dioxide produced. In fact, it is contended, by some authorities, that the increased metabolism brought on by the pathological cause is the forerunner of the high temperature, rather than the result of it, and represents Nature's means of increasing the power of resistance on the part of the body.

In fever, urea is produced in amounts far in excess of that produced artificially, by raising the temperature of the body with hot baths.

On the other hand, when fever is produced experimentally by the injection of bacteria, a very decided increase in the amount of excretion occurs, even when the temperature has been controlled and prevented from rising, by the application of

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cold. Thus, in some instances at least, metabolism appears to precede the high temperature. In intermittent and septic fevers the maximum amount of oxidation is reached long before the maximum temperature.

As I have said before, it is claimed that high temperature accompanying fever represents a protective mechanism; and, indeed, from a bacteriological standpoint, this seems to be plausible. For instance, the streptococcus of erysipelas does not develop at a temperature of 102° – 104° , and is killed by a temperature of 105.5° F. Clinical experience also shows that cholera patients with a high fever have greater chances of recovery than those showing no such rise in the temperature. Thus it seems that the increase in metabolism in fever may be a natural protective resource, rather than the effect of high temperature. And the high temperature thus produced, *when not excessive*, may be looked upon with favor.

Moisture bears a close relation to the amount of metabolism, not by stimulation of the process itself, but probably by supplying a condition most favorable for it. The normal amount of water in the composition of protoplasm may vary from 60–90 per cent., and above or below these amounts contraction is impossible. Within these amounts metabolism increases in amount as the percentage of water increases from the lowest to the highest. Thus a certain amount of water is absolutely essential in order that this important bodily function may be exercised. That water exerts a profound influence upon nutrition has been proven conclusively by numerous starvation experiments. In starvation, the first demands are made upon the fluid contents of the body, and this increases until the percentage of water falls below the lower limit at which protoplasmic activity is possible, and necessarily death is the result.

The intimate relation of water to metabolism is very nicely illustrated by observation upon the elimination of nitrogen in this same connection, and which, as has been before stated, is considered as an index to the amount of wear taking place upon the tissues. Data collected on this point show that from the

first to the last day of the test, there is an ever-decreasing amount of nitrogen eliminated, the interpretation of which must necessarily be that metabolism varies directly with the supply of moisture in the tissues.

On the other hand, when water is consumed in large amounts, metabolism is correspondingly increased, as determined by the amount of urea excreted. This result is not due to the flushing out of the system, for it has been shown that urea does not accumulate when water is withheld, but the increase in urea occurs by actually increasing proteid decomposition. Colin's experiments upon starving horses illustrate this point in a practical manner. He found that by supplying water to a starving horse, he was able to sustain life for a period of thirty days, and in case both food and water were withheld, death occurred much earlier. The possible explanation of these experiments is that the water was able to sustain life, not because of its own value as a food, but only by supplying the necessary moisture for the process of metabolism, thus allowing the animal greatest utilization of his own tissues. This experiment therefore suggests the extreme importance of water to the system, and especially in starvation.

In view of the fact that water stimulates metabolism, and thus favors the excretion of solids from the body, it is natural to suppose that it would bring about a decrease in the weight of the body, but practical experience has shown the opposite to be the case, and this is probably accounted for by its simple retention within the tissues.

It is a commonly known fact that the amount of food consumed is influenced by work, and that it increases in direct proportion as the amount of muscular work increases. It is also a fact that under these conditions, the body does not ordinarily increase in weight, so that the additional amount of food consumed must be utilized in the production of heat and energy, and the amount of metabolism correspondingly increased. Consequently the question naturally arises: Does the source of energy reside in an increased oxidation of proteids or the non-

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proteids? To throw light upon this, numerous elaborate tests have been conducted, and many theories advanced.

Of all the explanations offered that are worthy of note, only two contend that energy is produced at the expense of increased oxidation of proteids, Liebig so contended up till the time of his death, while the preponderance of evidence remains on the other side. Indeed the first explanation hardly seems plausible, inasmuch as our beasts of burden, when performing their heaviest work, subsist almost entirely upon a non-proteid diet.

A very unique test was performed by two eminent physiologists, which explains this in a very satisfactory manner. These men undertook to climb an incline of a definite height, and each knowing his own weight was able to estimate the actual amount of work performed, allowing due consideration for the work performed by the heart and the respiratory muscles. Also, in order that no discrepancy might enter into the test, for seventeen hours previous to, and eight hours subsequent to the making of the ascent, they partook entirely of non-proteid food, that they could be reasonably sure that all the urea collected came from the utilization of the tissue proteids. The result of the experiment indicates that the real amount of energy liberated was greatly out of proportion to the proteids oxidized, and further, the amount of urea eliminated was not notably increased.

Other similar experiments upon man and dog show that not only may the energy of muscular work liberated be greatly in excess of the potential energy of the proteids oxidized, but also that the amount of metabolism of the proteids is not influenced, for the amount of urea excreted is no more than during periods of rest. This is the explanation of the working diet of the horse, which experience has taught to compose largely of non-proteid foods.

The relation of foods of various kinds to metabolism has been the subject of many lengthy discussions, and the object of extensive experiments. Indeed, volumes have been written, but in view of all this there still remain numerous factors of

uncertainty that determine this subject still in its infancy. Some facts have been ascertained, however, and it is these that I propose to offer.

First, as regards the metabolism of proteids, there are two things sufficiently definite to merit being called laws. These have been formulated in the following manner :

1. Consumption of proteids is largely determined by the supply.

2. Within normal limits, proteid consumption is nearly independent of the muscular work.

In respect to the first law, I may say that it involves the condition which we designate a nitrogenous equilibrium, and which is the normal state of a healthy body, during which, the nitrogen excreted, exactly counterbalances that amount taken in with the food. That is, in respect to the nitrogen, the body does not store up any for further use, but continually uses up its supply. That this nitrogenous equilibrium is maintained at different levels, and that the body does not ordinarily store it up for future use, can be seen from the corresponding increase in the secretion of urea with the increase of nitrogenous constituents of the food, *i. e.*, proteids directly stimulate metabolism. If the proteid in the diet is suddenly increased, very soon the body adjusts itself to the change, and a corresponding elimination occurs, and this indeed, is an indication that the body is in a perfect state of nutrition.

Inasmuch as the source of energy does not lie in the increased oxidation of proteids, and inasmuch as increased proteid consumption does not secure its retention in the system, it is probably very true, as many of our foreign investigators have said, our methods of feeding are wastefully nitrogenous. Had I the time, I could cite you to many experiments conducted by these authorities to authenticate their statements, but many interesting topics that this subject may suggest will have to be left to us individually to be looked into at more appropriate times.

As concerns the second law which infers that metabolism of proteids is nearly independent of muscular exercise, I need only

to recall the experiment cited a few minutes ago, to substantiate it.

From these facts we may conclude that the principal significance of proteids is to supply to the system that which is lost during the ordinary wear and tear of the tissues. Also, the proteids consumed in addition to the amount absolutely necessary are not retained in the system, but only serve to stimulate metabolism in a corresponding degree. There is, however, a small amount of the proteid retained in the system that does not repair tissue waste, and does not become a part of the tissues of the body. This has been called circulating proteid, and is the first to be oxidized in a state of abstinence from food. It interferes in no way with the nitrogenous equilibrium.

Relative to the non-nitrogenous foods, I may say that what has been said concerning proteids is exactly the reverse in this instance. Unlike the proteids, these foods do not enter into the structure or repair of active tissues, and indeed bear no direct functional relation to the body. On the other hand, they are simply retained in the system to be oxidized as the needs of the system demand, when their potential energy is liberated and converted into heat and muscular work.

Thus it has been primitively expressed, "The proteids build up the frame work of the great muscular machine, and keep it constantly in repair, while the fats and carbo-hydrates simply act as fuel to feed the furnace of life."

Also, unlike proteids, metabolism of fats and carbo-hydrates is anything but complicated, and apparently yields to explanation by the ordinary chemical laws. The fats after being absorbed, are deposited in the interstices of the tissues as fats, probably in a slightly altered condition, while the starches and the sugars are deposited in the liver and muscles as glycogen, with a small amount circulating in the blood as invert sugar. (Normally 0.1%, during starvation, more.) With our knowledge of the simple molecular composition of fats and glycogen, we can readily appreciate how the mere supply of oxygen will bring about a perfect oxidation of these substances, with the production of

carbon dioxid and water. In this simple complete oxidation of the fats and carbo-hydrates, we have the fruitful source of all the energy of the body.

Hence the conclusion must be that the proteids repair tissue waste and enter into the structure of the living protoplasm, while the fats and carbo-hydrates are entirely inert, and by their simple oxidation liberate their potential energy, which is converted into muscular work.

The practical applications to be made of these facts concerning metabolism are no doubt manifold, but have been considered from two viewpoints, namely, hygiene, and animal nutrition. Time will not permit of a detailed discussion of the subject from each of these phases, but in brief, I may say that from a hygienic standpoint, it should be our endeavor to increase metabolism in every justifiable manner. In the treatment of fevers we should provide plenty of pure air, water, heat, light, exercise, etc. Certainly in the handling of healthy animals, these things should receive our first consideration.

On the other hand, from the standpoint of fattening animals, all the influences which tend to hasten metabolism should be held in abeyance, thus a dark stable, poorly ventilated, and where little or no exercise is permitted is conducive to increase in weight, and in a corresponding degree noted for the tendency to rob the animal of his vitality.

Thus my friends, although I have left many things unsaid, I have outlined to you in brief manner some facts concerning metabolism, which I trust may prove of some benefit to you.

DISCUSSION.

L. V. Shipley said that a higher temperature amongst cattle was possibly the reason for their immunity to glanders.

C. Stewart cited pleurisy with a high temperature. Acetanilid and jaborandi would reduce the temperature and hasten convalescence if given early.

J. H. McNeil thought that fever was the result, not the cause. Toxines caused the different heart conditions; thought very highly of cold applications.

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VETERINARIANS IN THE WEST.

By DR. Z. VELDHUIS, KANSAS CITY, MO.

Presented to the Annual Meeting of the Michigan State Veterinary Medical Association,
February, 1904.

The West not being as thickly settled as the East, it seems evident that the veterinarian must have a larger territory for his work, charge more, or have work of a different nature in order to make a financial success. This is certainly the case in different places. The qualified veterinarians are few in the West, though it seems now the number is increasing rapidly.

The work being different, is especially noticed where infectious diseases are prevalent. Both anthrax and symptomatic anthrax are present in many of the Western States. Treatment for these diseases, if any, is prophylactic. Vaccination for both these diseases is carried on to a considerable extent. It is sometimes left in the hands of the laity; but, where a qualified veterinarian can be had, his services are preferred, at least so far as to supervise the work.

Texas fever is another disease where prevention is of interest to the veterinarian, and in this, though the Federal Government tries to control the spread of the disease, and the quarantine work is left in the hands of the Government employés, the practicing veterinarian will be called upon to inoculate cattle with blood from immune animals. This is practiced particularly in young cattle north of the quarantine line, which are to be used for breeding purposes in the Texas fever districts. Two inoculations are generally made, about five months apart, a certain time before being shipped South. The immunity is supposed to last from six months to one year, depending on the age of the animal and condition of the individual. Actinomyosis is not a very dangerous disease, and is not prevalent in Michigan, but is often brought to the veterinarian's attention and treated in the Western States.

Glanders has been very prevalent, and is still very common in the States of Missouri and Kansas. This last summer and

fall, cases were noticed most every day in this town, and I have had occasion to see a number. The mallein test is thus brought into use a good many times. Sometimes the disease is easily recognized and no test is required, at other times it is quite necessary. The salaries of the State Veterinarian of Missouri, and his deputies, and the office of the veterinarian itself, are far better than those of Michigan. Glanders comes under the notice of the general practitioner as well.

Asidē from contagious diseases, we have in some States (Montana and others) poisoning from certain plants, as the loco weed, lupine, and others. Then on the ranges the spaying of heifers is practiced, and is sometimes done by the laity or experts in that line, but in some places affords employment for the veterinarian.

The laws governing the practice of veterinary medicine and surgery in the West are about the same as they have been in Michigan for years. That is, they are being formulated and put in the hands of the legislators, and at some future time there may be some laws.

Veterinary schools further West than Chicago are not numerous. Iowa has one; there are three in Kansas City; one in San Francisco, and one in Pullman, Washington—all three-year schools but one. The Kansas City Veterinary College is a well-established three-year school. The Kansas City University Veterinary College is a school still in its infancy, though claimed to be a three-year school. The Western Veterinary College is a two-year school, something like the Grand Rapids School. The Kansas City Veterinary College, where the writer is attending, has a fine new building which is a credit to the veterinary profession, and would make many a veterinarian wish to graduate again, if they could see this fine structure with its equipments. Those who get the AMERICAN VETERINARY REVIEW will have noticed a description and illustration of the building in the August number. The number of students now enrolled is 192, of which 38 are seniors, and four post graduates.

Veterinarians acting as meat inspectors or employés of

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the Bureau of Animal Industry are stationed all over the United States, but especially in the Western States on the quarantine work, for such diseases as sheep scab, Texas fever, *maladie du coit*, anthrax, glanders and others. Then in the stock yards as ante-mortem inspectors, and in slaughter-houses as post-mortem inspectors. There are in Kansas City some sixty or more doing this work, about 25 or 30 doing ante-mortem inspection, of which only two or three are veterinarians; the rest are stock examiners. Of the thirty, or about that number, doing post-mortem work, five or six are stock examiners or taggers, and five are temporary inspectors. Those temporary inspectors and stock examiners are given this work because there is more demand for inspectors than there are eligibles for the position. Even now they are short of inspectors here, as the examination in October did not leave enough eligibles to fill the places.

The diseases noticed on post-mortem inspection for which carcasses are condemned are quite numerous. Some of you who get the reports of the Bureau of Animal Industry will know. Those most often found in cattle are actinomycosis and tuberculosis. In hogs, cholera, swine plague and tuberculosis. Septicæmia and pyæmia are found in the different animals. There are probably more sheep condemned for emaciation, and those that are dead or nearly dead before they reach the shambles, than are condemned for disease. The cause of being anæmic or emaciated is often due to some parasite, quite often to the *oesophagostoma columbianum*, causing nodular disease, which can be detected by the presence of the nodules in the intestines.

Various pathological conditions are met with in the different animals, some of which warrant the condemning of the carcass and some do not. Those cattle which are inspected ante-mortem and rejected are marked with paint and a metal tag numbered and put in one ear. Most of these are, as a rule, slaughtered at the abattoirs. The inspector at the abattoir receives a letter, which gives a description of the animals rejected in the yards, tells the number of the tag, and the letter is returned to

the inspector at the yards with the report of the post-mortem findings. The animal may be condemned or passed, as the case may be. Cases of actinomycosis are generally local and are passed unless badly emaciated. When it is generalized, probably one case in fifty, the whole carcass is condemned. In actinomycosis the head is usually condemned if disease is localized.

The two cities, Chicago and Kansas City, have the largest stock markets, and the largest or most packing houses, in the United States, and it is there the most Government men are employed.

It seems at the present time that there is a better field for the veterinarian than eight or ten years ago. The State of Montana has a few county meat and milk inspectors appointed by the State.

The position of army veterinarian is more inviting than formerly. All along the line we notice the profession is coming to the front in East and West.

READ the preliminary programme of the St. Louis meeting of the A. V. M. A., on page 400, and then prepare to participate in the stirring event, Aug. 16-19.

APROPOS of the discussion in the REVIEW a year ago as to the rarity of white foals, the *Breeder's Gazette* of recent date published a half-tone illustration of a brood mare and her *pure white foal* at her side.

HYDROPHOBIA.—Thorpe (London *Lancet*, May 14) states that the powdered seeds of a species of strychnos, probably *strychnos nux vomica*, have for several hundred years been used in China as a remedy for hydrophobia—probably on the principle of *simila similibus curantur*. The dose, expressed in terms of the alkaloid, would be from $\frac{1}{15}$ to $\frac{1}{33}$ grain.

ESSAYISTS from Germany, France, Canada, the Philippines; from the extreme West, the extreme East, the extreme South, the extreme North, with a generous sprinkling from all parts of the centre, will be the literary offering at St. Louis in August. These may be read in the printed "Proceedings" next winter; but the discussion of the papers loses half of its merit when taken from the speakers' mouths and placed in cold type.

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TUBERCULOSIS IN DUCKS.

BY WALTER E. KING, A. B., OF THE DEPARTMENT OF BACTERIOLOGY AND PATHOLOGY, NEW YORK STATE VETERINARY COLLEGE.

The study of avian tuberculosis has disclosed the fact that this disease is not at all uncommon in the domestic fowl, and cases are recorded of tuberculosis in many species of birds. Among the common farm-yard birds, chickens seem to be the more frequently affected; however, tuberculosis is not rarely found in some other species, such as the guinea fowl, pea fowl and pigeon. Weber* states that this disease is found most commonly in the common fowl, pea fowl, guinea fowl, grouse, pigeon and partridge. Tuberculous lesions have been found in the parrot, swan and in many wild birds. Sibley † in 1890 describes a case of tuberculosis in a swan which he post-mortemed. He states that from his observations, the greater percentage of cases do not occur in graminivorous than in carnivorous species, but that such might be believed to be true because the opportunities for examining cases among the graminivora are greater.

Weber, in 1892, says that Dr. Edwards Crisp was the first to observe that grain-eating birds were alone affected in farm-yards. From the work of Dr. Crisp it was evident to Weber that tuberculosis affected only grain-eating, fruit-eating and vegetable-feeding birds.

Mention has been made of Weber's observations in regard to the relatively frequency of tuberculosis in different species of poultry. Cadot ‡ from his observations, gives in the main, the same list of species, placing the chicken first, then the pheasant,

* Weber, S. E. Review of the Avian Tuberculosis, *Jour. of Comp. Med. and Vet. Arch.*, Vol. XIII (1892). p. 429.

† Sibley, W. K. Tuberculosis in Birds. *Jour. of Comp. Med. and Vet. Arch.*, Vol. XI (1890), p. 317.

‡ Cadot et Roger. A Contribution to the Study of Avian Tuberculosis. Studies in Clinical Veterinary Medicine and Surgery (1900). (Translated by Dollar.)

guinea fowl, turkey, pea fowl and pigeon. He also makes mention of the parrot and swan.

In regard to the relative frequency of tuberculosis in chickens and ducks, Cadiot* in 1895 makes the statement that in poultry yards where chickens are decimated, ducks very generally resist entirely, or only a very few succumb to the disease. He followed for four years an epizootic of avian tuberculosis in Paris which killed 60 fowls and not a single duck, the ducks living under exactly the same conditions of environment as the chickens. His list of observations up to that time give more than 200 cases in chickens and only two cases in ducks. His conclusion is that all species in a poultry-yard are probably subject to infection with tuberculosis, but while common in some species, in others it is rare.

In discussing the above article of Cadiot's, M. O. Lancher cites a case of a duck which he post-mortemed in which he found tuberculous lesions.

On Jan. 11, 1904, a duck which had died during the previous night, was sent from a neighboring farm for post-mortem examination. No history of the case was obtained, the duck being apparently well the previous day. On post-mortem the following lesions were found: The liver was somewhat decolorized, sections of which showed fatty degeneration and congestion. On the gizzard there were a few hard whitish nodules and a black necrotic mass 1 cm. in diameter firmly adherent to it. The other organs were normal in appearance. Cover-glass preparations were made from the nodules on the gizzard and stained with carbol fuchsin for the tubercle bacterium, which on examination revealed a considerable number of organisms which took the tubercle stain. A guinea-pig was inoculated subcutaneously with a piece of the necrotic tissue. The animal died 39 days later, but no lesions were found.

Morphologically, the organisms in the preparations made from the duck resemble quite closely those in preparations

*Cadiot. Sur la tuberculose du cygne. Bul. de la Soc. Cen. et Med. Vet., Vol. XLIX (1895), p. 570.

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made from the tissue of chickens affected with tuberculosis. The organisms obtained from the tissue of the duck varied in length from 1.5μ to 2.9μ , the average being 1.9μ in length and about $.3\mu$ in breadth. A considerable number of slightly curved forms were observed. In general they took the stain uniformly, only a very few beaded forms being found.

"BUSINESS is rushing here, in spite of a larger influx of automobiles."—(G. R. Young, D. V. S., Omaha, Neb.)

PREVENTION OF MILK FEVER.—Mr. John Gilbert, of Tolworth Court Farm, Surbiton, in a letter to the London, England, *Live-stock Journal*, of May 27, 1904, writes: "I will introduce my plan of prevention by stating that I have milked about eighty cows, and calved quite one hundred a year (as I buy incalvers), and for the last twelve years without one single sign of a case of milk fever, though previously I had lost many. I may say that I had the tip quite by accident, from, in my opinion, without doubt the very best dairy farmer in England. The plan is too simple for many to believe in its effectiveness, but I am open to wager anyone the odds of two to one annually that I do not have a single case. The plan is as follows: 'Every cow coming with her third calf or over shall be liberally fed on usual keep, according to time of year; in winter she shall be kept in a box (loose) when expected to calve. She shall have one or two pints best linseed oil a day or so before calving, and again twelve hours after calving; bran mash an hour or so after calving, and bran mash, with chaff and hay, for two days. The cow and calf lie loose, but the cow shall not be milked for at least forty-eight hours after calving. In the case of a dead or weakly calf, about a quart may be milked four times in twenty-four hours. And this is the whole secret. To many it may seem unnatural, but a heavy-milking cow is an unnatural animal. And is it natural to take from a cow just calved what the calf would not take until a month old? The strain on the system in replenishing the milk supply is, I think, the sole cause of milk fever—together with the neglected state of the bowels. If anyone will read this plan through very carefully, and then make up his mind to try it faithfully in every case, and immediately discharge even the best man in his employ who disobeys his instructions in the slightest degree, I honestly believe the odds of my wager given above may be doubled with safety.'"

MALIGNANT ŒDEMA.

BY DR. V. SCHAEFER, TEKAMAH, NEBR.

Read before the Nebraska Veterinary Medical Association.

Malignant œdema is of great importance to the veterinarian and stock-owner, as it resembles to some extent anthrax. The disease is not so very common, but, when it does appear, it nearly always proves fatal, and may affect a number of animals in the same herd at the same time. The disease is caused by inoculation into the subcutaneous connective tissue the œdema bacilli (Koch), *Vibrio septicus* (Pasteur). The bacilli are said to exist in large numbers in the superficial layers of the soil.

As before stated, the disease nearly always proves fatal, and quite often in a very short time after being noticed, a number of cases within forty-eight hours, although some may linger for two or three weeks, this certainly depends to a great extent on the virulency of the disease germs.

Now, as this paper is intended more as a report of cases which came under my observation than it is to give anything new on this disease, I will describe a number of cases which I had to deal with in the past few years, both the symptoms during life and some of the post-mortem lesions as noticed by me. I will state here that in my first experience I did not recognize the disease, as I had never heard of it, and in consulting my text-books at that time none made mention of any such disease as I had to deal with. In 1895 I was called to a farm near Herman, Nebr., to investigate a peculiar disease, of which three or four horses and one cow had died and four more horses were sick. These animals were all running in a pasture located in the Missouri bottom. The first I noticed were the sick horses; they would eat and drink at that time, but had large œdematous swelling at the anterior part of the thorax, extending from one point of the shoulder to the other and extending back almost as far as the ensiform cartilage, and up the neck about two thirds the way to the angle of the lower jaw, and in the centre the swellings were from four to six inches in thickness and very

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sensitive to the touch. Not knowing what the disease was I made post-mortem examination on two of the horses which had died. On making one incision through the swelling it had a watery yellow appearance; the water seemed to run from it as from a sponge, and on opening the body of the animal, I found all of the connective tissue yellow, extending as far back as the lumbar region; in fact it had the appearance as if everything in the animal had turned yellow. I pronounced it a case of septicaemia due to inoculation of some septic material from the barb wire fence, as the swellings were in a very favorable location to have been produced in that way.

I treated these horses with stimulants, iron and quinine, but they all died in the course of two days. My next case was similar to the first case in appearance, only the animal lived for some time. In this case the swellings became gangrenous, with sloughing of a great portion of the connective tissue of the neck, including the oesophagus from its entrance at the chest up to the pharynx, so when the animal would attempt to eat the food would fall out at the openings caused by the sloughing. On post-mortem the oedematous swellings had lost the greatest part of the yellow appearance as seen in the other cases, they had become reddish brown and gangrenous. The internal organs, lungs, heart, spleen and liver, were of a reddish appearance, the spleen was thicker than normal and the liver was very much swollen; as I stated before, not knowing the nature of the disease, I sent several specimens to Dr. A. T. Peters for microscopical examination, with the results reported to me in a few days by Dr. Peters, malignant oedema. My next case was at Craig, Nebr., where one of the town milch cows was affected with a large oedematous swelling between the fore legs, involving the brisket and lower part of the neck. I treated this cow with injections of Lugol's solution deep into the tumor; after this the cow seemed to improve for a few days, then I made another injection of the same solution, but the cow died in the course of about ten days. My next case was in the spring of 1902, on a farm about four miles south of Oakland, Nebr. In this case the

swelling was similar to those cases already described, with the exception the swelling was so large as to spread the legs away from the animal's body and give it a bench-legged appearance and stand in a propping position; the swelling extended nearly as high up as the top of the shoulders and up the neck nearly to the larynx and was eight or ten inches deep at the sternum. I treated this cow with injection of tr. of iodine deep into the tumor and deep incisions, but this cow died in about three weeks. My next cases were on this same farm, Oct. 19th, 1903, when the owner came to see me. The man said that he had some cattle affected the same as the cow before mentioned, only that there were a good many and they were all in the feed yard and quite fat, almost fat enough to ship to market. I called at the farm that evening and in looking over the cattle we found twenty-three animals, all steers but one and nearly all of Hereford breed; the only cow which was diseased and drew the attention of the owner, was swelled nearly as bad as the one they lost in the spring of 1902. The swelling of the steers was not quite as bad as that of the cow and varied in size, from the size of a large water pail down to the size of a child's head. I now at once realized from my previous experience that I had a difficult case on hand, and of considerable value. After considering treatment I concluded to try potassium iodide in half ounce doses internally, three times a day, and externally I had them apply once a day a solution of one and one-half per cent. of bi-chloride of mercury. On my return three days later I found that it was impossible to give the medicine three times a day, therefore ordered three doses given at one time—that is to say, one and one-half ounces of the potassium iodide once a day to each animal. This was on Thursday, and on the following Monday all the animals showed marked improvement but nine, and they also showed well-marked symptoms of iodism. I reduced the dose to one ounce on all that showed improvement and continued the large dose on the others until marked improvement set in. I want to say here that I stopped the external application of the bi-chloride solution after it had been ap-

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plied three days, soreness setting in. I then instructed them to stop applying same for two or three days until the soreness subsided and then apply again as before. I will state, under this treatment all the animals made a complete recovery and have since been sent to market, with the exception of one, in which mechanical pneumonia was produced by drenching. My next case was that of a horse on a farm, near Pender, Nebr. On the first day of November, 1903, the swelling had been noticed for about one week. In this case we had the large oedematous swelling at the breast and inferior part of the neck; also the legs were all swollen. The fore and hind legs were so large that the animal had a very clumsy appearance while walking. This horse was treated similar to the cattle, and recovery followed.

ERRATUM.—June REVIEW, article on "The Blomo Patented Horse Food," page 298, line 22, for "annihilated," read "assimilated."

SEEKING VETERINARY LEGISLATION IN LOUISIANA.—Under date of June 12, Dr. W. H. Dalrymple writes the REVIEW as follows: "I have been trying to get some livestock sanitary legislation through at the present session of our General Assembly. The bill in its original shape did not seem to suit some of our short-sighted, uninformed statesmen (?), and was recommit-
ted to the calendar. The chief objection was to the creation of a new office (that of State Veterinarian), so I have had to get up a substitute eliminating that feature, and making it the duty of the Commissioner of Agriculture to employ the services of a competent and duly qualified veterinarian when in his judgment such is necessary. I enclose you a copy of our original bill, which I think is quite a big step for us in Louisiana, considering the amount of ignorance which prevails among our law-makers, and others, concerning the importance of such matters to the State. The substitute, if it passes, will be similar to the enclosed, except that the State veterinarian feature has had to be eliminated. I also send you the copy of a few points I got strung together to try to impress our legislators with the necessity for such legislation. So you see, although we are away down here on the 'outskirts' of the country, we are still endeavoring to keep up the fight for the profession and progress."

REPORTS OF CASES.

"Careful observation makes a skillful practitioner, but his skill dies with him. By recording his observations, he adds to the knowledge of his profession, and assists by his facts in building up the solid edifice of pathological science."

OXYGEN IN THE TREATMENT OF PARTURIENT PARESIS.*

By JOSHUA MILLER, V. S., Iowa.

The use of air, or pure oxygen, as a specific agent in the treatment of parturient paresis, came to my notice during the early part of last summer.

Drs. Tennant and Barnes, of London, Ontario, gave a brief review in the *Farmer's Advocate* of the use of air and pure oxygen by some veterinarians in Europe, in the treatment of this fatal malady, and at the same time stated the results of its application in eight or nine cases in their own practice. Later these gentlemen reported having used oxygen alone in forty-eight cases, with forty-seven complete recoveries.

We are greatly indebted to Dr. Schmidt for his discovery of the point of infection and for his treatment, which so far exceeded any treatment or remedy known up to that time. But in veterinary medicine, as in the other sciences, the triumphs of one year are surpassed by those of the next. The beneficial results of this new treatment are so rapid, so complete, and so uniform, that it is really remarkable, and no veterinarian need hesitate in adopting it.

Almost immediately after hearing of this new treatment I suggested its use to a local practitioner, and it is due to his kindness that I have to present to you a report of five cases. Knowing that you are all well acquainted with this disease, I shall only give a brief account of the symptoms.

Case No. 1.—A large high-grade Shorthorn, and fat as a corn-fed beef animal, had been sick about fourteen hours, and at 7 P. M. was found lying on her side, badly bloated and in a complete comatose condition. So near was this animal's life at the terminal point, that treatment would not have been attempted had it not been for faith in the new remedy and the anxiety to test it. The udder was cleansed and disinfected and the gas conveyed into it from the tank by a piece of rubber tubing, about seven feet long, and a teat tube, until each quarter was partially distended. The teats were taped to prevent the escape of gas and the patient put in a comfortable position. One hour

* Presented to the Annual Meeting of the Iowa State Veterinary Medical Association, 1904.

later there was some perceptible improvement, evidenced by eructation of gases, and diminished tympanitis and partial return of consciousness. But this improvement did not continue, and a stimulant and febrifuge was given by the mouth, and one grain of strychnine hypodermically. The bladder was emptied and an enema of warm water used. During the absence of the attendants about one hour for supper, the calf got hungry and in its attempts to satisfy its appetite, removed two of the tapes and drew off some of the oxygen. This was noticed on their return and these quarters were again filled and the stimulants repeated. No coughing was noticed after drenching, but her respirations became increased and did not subside for an hour or two. Whether this was due to the medicine entering the lungs, or repeating the use of the gas too quickly, I do not know. Patient was very quiet and seemed very weak during the early part of the night and up to 1 A. M. She was not seen again until 6 A. M., and no change was noted, except a decline of the vital powers. The tapes were removed, the udder again inflated and the stimulants again repeated. Kidneys acted freely, and the bowels moved considerably after the use of an enema. Patient was seen no more, on account of the distance, but owner reported she grew weaker and weaker and died at 6 P. M. on the second day of her illness.

Case No. 2.—A fine specimen of the Jersey breed was found in the first stage of the disease in the early morning and grew rapidly worse until 9.30 A. M., when she went down. At this time each quarter was filled with the gas and the teats taped. No other treatment was given. A shade was built over her and the flies kept off. No change was noticed until 3 P. M., when she suddenly rose to her feet and walked off, increasing in strength as she proceeded. At 7 P. M. she appeared all right excepting some constipation, a slight congestion of udder, which passed off in a day or two.

Case No. 3.—Large Durham cow manifested some illness in the evening and was found down and unable to get up next morning. The udder was filled with the oxygen gas at 10 A. M., bladder was emptied and enema given. At 6 P. M. no change, and the gland was again inflated. She did not succeed in getting up altogether, although she made frequent attempts, until midnight. The disease gradually vanished in the next few hours.

Case No. 4.—Jersey cow, twelve years old, was noticed sick in early part of day. First treatment given at noon. At 7 P. M. patient was able to stand, but was unsteady on her feet, and an-

other treatment was given. Next morning she was well.

Case No. 5.—A fine Holstein and a great dairy cow was found down and unable to rise, though she had been sick only a few hours with all the typical symptoms of the disease manifest. This case does not differ from the rest except in its rapid development and persistence. First treatment was administered at 10 A. M., the second at 6 P. M., the third the following morning at 6.30 A. M., the fourth at noon between 12 and 1 P. M. and the fifth at 6 P. M. Three hours later she got up and all the normal functions came quickly into action, including the bowels, which had not moved since or during the two days of her illness. At the time of the fourth treatment the cow was given one dose of aromatic spirits of ammonia and fl. ext. nuxvomica. As she seemed worse and as there were well-marked indications of collapse, the bladder was emptied twice a day, and as there was considerable prolapsus of the rectum there were enemas and bathing used and proper protection and support applied. A purgative was given at the last time of the treatment of the udder, the semi-comatose condition having almost completely passed away.

In reviewing this disease it is evident it is caused by the presence of an anærobic microorganism and its toxic products, producing first paralysis of the motor nerves and later the whole nervous system.

Past experience has proven that internal administration of drugs is of little use in any case and in many cases positively detrimental. Drs. Tennant and Barnes have concluded from their experience that the pure oxygen gas is all sufficient and all other medication is unnecessary. I do not mean to state that good nursing can be dispensed with and the general comfort of the animal neglected. As the cost of the treatment is a point to consider, I will state that pure oxygen gas can be obtained at almost every wholesale drug house or from the Chicago Oxygen Gas Co. at a cost of six dollars per tank, which contains sufficient gas to treat about one dozen cases, making an average cost of fifty cents per each patient.

DISCUSSION.—This paper was discussed quite freely by C. J. Hinkley, H. E. Talbot, and Hal C. Simpson. All reported very favorably on the use of air alone.

ST. LOUIS is neutral ground; let the East vie with the West in outnumbering each other, while the North and the South may contest the same question.

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HYPERTROPHY OF THE SPLEEN, WITH AMYLOID AND HYPERTROPHIED LIVER.*

By GEORGE N. WALROD, V. S., Iowa.

On October 4th last I was called to see the bay driving mare belonging to Judge Bailie. The Judge not being at home, Mrs. Bailie informed me that the mare had not been looking well for two weeks, but had eaten her feed until that day, and when I saw her it was about 9 o'clock in the evening. She had been lying down and showed signs of mild colic, but her temperature was $106\frac{1}{2}$, pulse 60, bowels tardy in action. Mrs. Bailie wanted me to take her to my infirmary, which is about two blocks away, which I did. Upon arrival at the infirmary I gave her a large dose of aloes and raw linseed oil, which acted well. As yet I had not made up my mind as to what was the matter, but I thought she needed a purge (I may say that she had been falling off in flesh rapidly for two or three weeks).

But after the purge her temperature was up to 104 to 105, with pulse ranging from 45 to 60, but she would eat her feed without medicine, so for two weeks I drenched her with a drachm each of potassium iodide, potassium nitrate, ferri sulphate and nux vomica, three times a day.

She seemed to feel some better, had more life and eat better, but still had high temperature and abnormal pulse; did not look very sick, but was getting thinner. About that time the Judge came home and wanted to know what I thought was the matter with the mare anyway, and I told him I thought she had enlargement of the spleen and perhaps the liver, and I thought a little grass would be good for her. I put her in a blue-grass pasture close to town, where she had good feed and a little oats twice a day for three and a half weeks. She seemed to like the grass, but she did not gain any; on the contrary, she got thinner. Then, on November 11th, I brought her to town and put her in the owner's barn, with no improvement save in appetite; she would eat a good fair feed three times a day, and still grew poorer. I saw the Judge again, and he wanted to know what I thought of the mare. I told him I thought she had a large spleen and a bad liver, and that I had done all I could for her, and that I thought she would die. I did not see him again until December 3d, when Mrs. Bailie sent for me again and wanted me to do something with the mare; she said she was down.

* Presented at the Annual Meeting of the Iowa State Veterinary Medical Association, 1904.

I went and found her down, with her head in the corner, in a position where she could not get up; she was perspiring and trembling. I moved her around in a better position, but she would not try to get up; this was in the morning about 9 o'clock.

I told Mrs. Bailie that I would try and sling her in the afternoon. Mrs. Bailie informed me that she had been eating well every day since I brought her home, and that she was still growing poorer.

I went home and at noon Mrs. Bailie telephoned me that the mare was dead.

I held a post-mortem examination, which revealed an enormously large solid spleen, weighing 44 lbs., and a starchy, firm liver, weighing 35 lbs.

All other organs were normal as far as I could ascertain, considering the conditions above mentioned.

[NOTE.—In the discussion Dr. J. H. McNeil reported a somewhat similar case as found at the Ames clinic.]

EXPERIENCE WITH ASCARIS MEGALOCEPHALA.

By Z. W. SEIBERT, V. S., Crestline, Ohio.

I was called to Mr. E. C. Gledhill's early Sunday morning, April 3, 1904, to see a sick colt. I arrived at the place in about one hour, and found a colt, four months old. The owner said the colt was all right the evening before, and ate his supper with greed. On going to feed in the morning he found the colt down and could not get up. The colt had the following symptoms: Down; extremities all deathly cold; circulation imperceptible; temperature 97°; dry, unthrifty coat; pot-bellied; respirations labored and frequent, distended abdomen, with some gases, and convulsions had taken place. The convulsions were tetanic in character. I told the owner that the colt was dying, and diagnosed the case as rupture of bowel caused by some obstruction, and that treatment would be unavailing. The colt died in half an hour.

Post-mortem showed that there was a rupture in the pelvic flexure of the large colon. When I opened the abdomen the fecal matter was found outside the bowels in the abdominal cavity, and some few *Ascaris megalocephala* were also found. This made me look further for the worms, so I examined the intestines all through; and, to my surprise, when I came to the small intestines I found them almost completely blocked with these worms, finding 580 of them, averaging 7 ½ in. long.

The peculiar part of this case is that the colt was always in good flesh and spirits, and I know it had the best of upland feed and water out of a pure running spring, and never ailed a minute until found down sick, and died in a few hours.

COMPLETE RADIAL PARALYSIS.

By T. F. MOYLE, V. S., Waterford, Wis.

This is a case of what Prof. Möller calls "complete radial paralysis," but, if my memory serves me right, Prof. McKillip calls it "brachial paralysis"; and, from the description given by the learned professors, I am inclined to Prof. McKillip's diagnosis. This makes the fourth one in the equine and one bovine that I have attended, and none recovered, nor could they bear one pound of weight upon the limb. I have not had the opportunity to hold a post-mortem on any as yet, but I may on this subject, for I expect a lawsuit out of this case. It is a three-year-old colt, which was scared by a dog while hitched to a cart. It got away from the driver and ran against a tree, striking against the shoulder. When rising it could not bear



any weight on the limb, but could advance the foot, as shown in the photo, without any apparent difficulty or signs of pain. No swelling nor soreness have appeared in the limb.

In Dr. Wyman's work on lameness, under cut of radial paraly-

sis, he says the elbow ought to be further down. In this case it is plain, for the elbow is six inches lower than the normal elbow can be brought. In both Möller's and Wyman's works their description of radial paralysis, some support can be borne by the limb; also the prognosis is favorable. In Prof. McKillip's description of brachial paralysis no support can be borne by the limb, and the end is invariably fatal. This tallies with my five cases. The four equine cases that I attended were colts from one to three years. The cow was in years, did not shrink in her milk, but had to be fed, as she could not get around in the pasture.

FISTULOUS WITHERS.

By SAMUEL GLASSON, JR., D. V. S., Veterinarian 9th U. S. Cavalry, Wawona, California.

After having undergone an operation for chronic appendicitis at the U. S. A. General Hospital at the Presidio of San Francisco, Cal., I was ordered to report for duty at Ord Barracks, Monterey, Cal. Shortly after my arrival at Ord Barracks, my attention was called to a case of fistulous withers in Troop D.

This case had been attended by a civilian veterinarian for at least a month prior to my arrival, and I decided to operate. I found some fibrous tissue and a couple of tracts, which I extirpated. One tract seemed to penetrate beneath the right scapula, and as I did not have a trephine at hand, I had the animal released.

After a couple of weeks of unsatisfactory treatment I again chloroformed the case, trephined the antea-spinatus fossa of scapula about two inches below the cartilage of prolongment, obtained good drainage, and the animal is now apparently as well as ever, having made the trip from Ord Barracks to Yosemite National Park, a distance of about 250 miles without incident.

RUPTURE OF ANTERIOR EXTENSOR OF PHALANGES.

By SAMUEL GLASSON, JR., D. V. S., Veterinarian 9th U. S. Cavalry, Wawona, California.

About a week after my arrival at Ord Barracks, I was called to treat a mare mule belonging to the Quartermaster's Department. This animal had been grazing, and, as near as I could learn, had stepped into a gopher hole, fallen and struggled with the foot fast in the hole.

The animal when seen by me, knuckled over at almost every step, also while standing, with the off hind foot, so that the anterior wall of the hoof rested upon the ground.

On close examination I could get no crepitus and diagnosed the case as rupture of the anterior extensor of the phalanges.

I had her placed in slings and a spring-steel splint welded to the toe of a shoe and the shoe nailed to the foot. I had the splint at an angle of about 70° from the shoe, the upper part of the splint being bound to the metatarsal region, thus keeping the toe extended.

The next morning I found the steel splint broken, so substituted one of iron.

After keeping the mule in slings and splint for six weeks, I discharged her as cured.

EVERY true veterinarian is necessarily interested in the steady upward progress of his profession. Veterinary schools are the chief spokes in the wheel of educational advancement. These factors will form a large section of the programme at St. Louis, Aug. 16 to 19. It is your duty to be present and assist in the solution of these problems.

DR. DALRYMPLE'S GREAT SERVICE TO FARMERS APPRECIATED.—Dr. Dalrymple, of the Louisiana Experiment Station, has done the farmers of the United States good service by his recent investigation to devise a remedy for the intestinal diseases of sheep. These complaints, if they may be spoken of in the plural number, have all but driven the farmer living in low altitude lands east of the Missouri river out of sheep growing, the whole country having been more or less infected. Thoroughly discouraged by unsuccessful efforts to breed lambs, the corn-belt farmer has virtually concluded that his sphere as a mutton-maker is limited to the finishing of range-bred woolskins. Dr. Dalrymple has demonstrated that the disease may be eradicated by marketing infected stock and cleansing pastures by cultivation. The correctness of his theory is proved by recent success at sheep growing in central Illinois, where a decade ago intestinal diseases forced growers to get rid of their breeding sheep. Lately they have resumed and have had no trouble. Sheep breeding will yet be profitably conducted all over the low altitude section of the United States, and this will be accomplished by working on lines suggested by the Louisiana investigator.—(*Live Stock World*.)

EXTRACTS FROM EXCHANGES.

ENGLISH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

A CASE OF FRACTURE OF THE PYRAMIDAL EMINENCE OF THE OS PEDIS (BUTTRESS FOOT) [*A. R. Routledge, M. R. C. V. S.*].—This mare, aged nine, was doing the work of a stage horse. She became lame upon the right fore leg, and, notwithstanding treatment, she grew worse. The foot was long and narrow, the fetlock slightly deviated outwards, but these conditions were not sufficient to establish a diagnosis. Median neurotomy was performed, and her lameness improved by half from what it was. A month later ulnar neurotomy was resorted to with perfect success; the animal was able to resume work after three weeks. From that day (say the end of June) to the following February she worked. During that month the coronet became the seat of a swelling, which covered the front of that region and extended outwards, soon becoming a true bony deposit. Then the whole leg began to swell, the swelling extending upwards to the point where median neurotomy had been performed. It kept increasing, the lameness returned, and in walking the animal's foot came down first on the ground with a tendency for the toe to turn upwards, as in breaking down of the perforans tendon. The mare was killed. At the autopsy were found: a softening of that tendon, a slight lesion of navicular disease, degeneration of the corono-pedal articular cartilage, and an old fracture of the pyramidal eminence, with a false union to the body of the bone. There also was a recent fracture of a portion of the third phalanx, at the point of articulation with the os navicularis, which, with the lesions of the perforans, probably accounted for the final breaking down. By the neurectomies performed, one year's work was obtained from an animal which would have remained otherwise a hopeless case.—(*Journ. of Compar. Path. and Therap., Dec., 1903.*)

AN OUTBREAK OF VENEREAL DISEASE IN SHEEP [*W. H. Flook, M. R. C. V. S.*].—Aug. 15, fifty-two yearling ewes and two young rams were bought and brought to a farm. Shortly after their arrival, it was noticed that one of the rams had a discharge from the sheath, while on the other were observed around the mouth and nose an eruption rather extensive. Although it was not known if the ewes had been covered before being pur-

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chased, they were separated from the rams; these two were placed with a small flock of older ewes. After a few days it was observed that a certain number of these were affected with a disease of the vulva. The rams were then isolated; they had remained about a week with the old ewes. The only symptoms observed were: a large swollen condition of the vulva and raw, bleeding sores on the cutaneous and the mucous surfaces of the labia. The temperature was normal and general condition good. Inside the sheath of the ram there were small raw, ulcerating sores. The sick animals were isolated from the others, and the sores dressed with antiseptic lotions and iodoform. "As the rams were marked with color on the breast and between the fore legs, it was easy to find which ewes had been covered; yet one or two were diseased, and had not been covered. The tail of the ewes were docked very close and left insufficient to cover the vulva. Perhaps the infection was carried by flies or perhaps also by the rubbing of the ulcerated nose of the ram thus affected."—(*Journ. of Comp. Path. and Therap.*, Dec., 1903.)

A CONTAGIOUS DISEASE OF THE GENERATIVE ORGANS IN SHEEP [*Prof. J. McFadyean*].—Having visited the animals whose case is reported by M. Flook, the Professor published notes which he had made on a similar trouble in 1896. The disease was observed in a flock of ewes in the county of Suffolk. Twelve ewes were affected. The labia of the vulva were much inflamed, swollen and painful. In some there were ulcerations. There was purulent discharge. The ram which had served them could not be examined. Pledgets of cotton were impregnated with pus from the discharge, and one was inserted in the vulva of a ewe and another in the sheath of a wether and a third in the vulva of a cow. The result was negative in the ewe and the cow. With the wether it was observed, on the second day, that there was swelling of the part and formation of scabs, which obliterated the sheath; the fourth day this part was swollen, red, and there was some discharge. Ulcerations and small ulcerative abscesses took place also. Another attempt at inoculation of a sheep and ewe, made fourteen days after, gave a negative result. The pathogenous microbe cause of the trouble could not be isolated.—(*Journ. of Comp. Path. and Therap.*, Dec., 1903.)

EPIZOÖTIC LYMPHANGITIS IN ENGLAND [*Prof. J. McFadyean*].—As a consequence of the South African War, an equine disease, heretofore unknown in Great Britain, has been introduced, and, although the case reported by the author has been

observed in an army horse, condemned and sold at auction, there is room to fear that private horses will not remain exempt from it. This case is recorded to call the attention of veterinarians to the possibility of meeting with the disease, and also to remind them of the chances of error of diagnosis with farcy. It was a roan gelding, which had a swelling of the near hind leg, extending from the foot up to the thigh. Between the coronet and the middle of the shank there were several running sores and immediately above the hoof a rather large ulceration. The animal was lame and in poor condition. On the inside of the leg, a little above the hock, there was a subcutaneous abscess which, when punctured, gave a quantity of pus, some of which was immediately examined under the microscope and served to settle the nature of the disease by the presence of large numbers of cryptococci. To confirm the diagnosis and avoid all possibility of error, mallein was resorted to, but negative results were obtained. The cryptococci were readily observed with a magnifying power of 500, or better of 1,000. No method of coloration was needed. In his article, the author concludes by saying that the fact of the introduction of epizootic lymphangitis in England shows the mistake of bringing back army horses from South Africa, and specially to allow them to be sold to private individuals. The long period of incubation of the disease and the fact that several cases have already been observed in army horses since the beginning of the year, justify the supposition that the animal subject of the report was infected when he was sold. Several thousands of horses have in a similar way been distributed all over the land, and now the whole country may be considered as being permanently infected.—(*Journ. of Comp. Path. and Therap.*, Dec., 1903.)

FRACTURE OF THE OS SUFFRAGINIS AFTER NEURECTOMY [*A. R. Routledge, F. R. C. V. S.*].—A twelve-year-old horse has been lame periodically in the left fore leg. He started in good condition, then after a short time the lameness makes its appearance, and it increases more and more. Sometimes one day of rest is sufficient for him to resume work; at others he is laid up for a longer time. This condition has existed for twelve months. But while the lameness becomes more frequent, a bony deposit has taken place on the first phalanx, and finally the useless animal is neurectomized in the median nerve. After two weeks he resumes work. But the lameness returns and ulnar neurectomy has to be performed. Twenty days after he resumes his work, but only for three days, when he suddenly becomes

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very lame. At rest, the fetlock was held in the normal position, but as soon as extra weight was thrown on the limb by putting a man on his back, turning the head to the near side or during progression, the fetlock sank to the ground and the toe cocked up in the air with the heel downwards. There is a fracture of the os suffraginis. At the post-mortem there were found: a transversal fracture of the os suffraginis, from side to side, dividing it into two fragments, one of which is crushed in several pieces. There is rarefying osteitis. The perforans tendon is softened and loosened from its attachment to the os corona. The navicular bone was also diseased.—(*Vet. Record, Jan. 16, 1904.*)

THREE CASES OF RUPTURE OF THE HEART [*H. Taylor, M. R. C. V. S.*].—The first was observed in a cob. Kept in the stable for a cold for two days, he seemed to be doing well, when on the third day he appeared in great pain. Called to see him, the author found him suffering a great deal, with staring, haggard countenance, and an abundant discharge of foaming liquid escaping through both nostrils. The sides of the stalls and the floor are spattered with it, as the animal in his efforts for breath and shaking his head up and down, has sent it in all directions. The mouth is partly open, the lips retracted, mucous membranes are pale, pulse is scarcely perceptible, the sounds of the heart cannot be heard, the body is covered with a cold sweat. After two hours' suffering, the animal drops and dies without a struggle. The discharge from the nose becomes thick and foaming, mucous membranes of red color. At the post-mortem, the pericardium is found full of blood; there is more in the chest; the right auricle is ruptured on its upper face, the laceration measures one inch in length, half an inch in width. The cavities of the heart were empty. The myocardium was rather soft and slightly yellowish. The second animal fell all of a sudden, without having ever exhibited any symptoms of sickness. With him, the chest contained a large quantity of blood; there was a rupture of the right auricle, four inches long. The heart was slightly hypertrophied, the walls thinner than normal, the tissue fatty. Being treated for a dietetic trouble the third animal gave manifestations of heart trouble and died. The organ was hypertrophied, the walls thin, the tissues of the heart soft and yellow. The right auricle had a rupture four inches in length.—(*Vet. Record, Jan. 30, 1904.*)

SARCOMA OF THE PENIS IN A DOG—AMPUTATION [*H. Taylor, M. R. C. V. S.*].—An old Irish terrier, twelve years of age, had a paraphymosis, due to a tumor on the end of the

penis, which, in addition to appearing unsightly, used to bleed and soil the carpets. The tumor was as big as a nutmeg. The prepuce had also several others much smaller. The large growth had been there for several months, and it was evident that amputation was the only means of relief. The dog was chloroformed, the penis drawn out of the sheath, and a catheter introduced and secured by a ligature applied a little above the place where the amputation was to be made. With a circular incision the penis was then divided, carefully saving the urethral canal in its entirety. The incision was made a little back of the point of the os penis, a small portion of which had to be excised. The urethra was then carefully isolated from the inferior border of the body of the penis for about half an inch in length, and the diseased portion of the organ was then removed. The urethral canal was then slit with three incisions in three portions, which were secured with stitches on the skin of the upper portion and lateral faces of the stump of the penis. The ligature was taken off, the catheter removed; there was but little hæmorrhage; the stitches were taken out on the fourth day, and when the dog was examined five months later, there was no indication of stricture, and the end of the penis presented a round, smooth surface. The nature of the growth was proved by microscopic examination.—(*Vet. Record*, Feb. 6, 1904.)

FRENCH REVIEW.

By Prof. A. LIAUTARD, M. D., V. M.

TEMPORO-MAXILLARY ARTHRITIS [*M. A. Huret*].—Its treatment is always justified. A mare receives a kick on the left temporal region and arthritis sets in. A week later, the animal is cast and the fistula is freely incised. A necrosed piece of bone is removed, the temporal bone thoroughly scraped, the articulation is freely washed with Van Swieten's solution and permanganate ($1 \text{ } \frac{1}{1000}$), then an injection of pure tincture of iodine is thrown in. The wound is covered with iodoformed compresses. The same dressing was kept up for several days, and by degrees the synovial discharge grew less and less. A pencil of nitrate of silver was then introduced to try to obtain complete arrest of the synovial flow. In three days a thick scab was formed, the articulation was closed, cicatrization went on rapidly, and recovery was completed in a month from the day

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ENCEPHALOID SARCOMA OF THE TESTICLE IN A HORSE [*Peuch and Ball*].—Aged 11 years, a stallion has, for several months, in the testicular region, a swelling, which is rapidly enlarging and interferes with his actions. This swelling is not painful, hard, not adherent to the envelopes, and feels like an hypertrophied testicle. The cord is thick. It is evidently a sarcocele, which predisposes the animal to hernia and demands interference. It is not a glanderous sarcocele—the horse does not react to mallein. The operation of castration is performed. Scrotum and dartos are divided and pushed upwards; a large straight wooden clamp is applied on the cord; then the fibrous coat is divided and the testicle removed. The animal had no bad effect from the operation, and was able to resume work a few days after the removal of the clamp, which was done on the tenth day after the operation. The testicle was more globular than usual, its external surface was slightly bosselated, its consistency was firm and elastic. It measured 17 centimetres from forward backwards, and weighed 1310 grammes. Its structure examined with the microscope revealed its sarcomatous nature.—(*Journal de M. Vet. and Zoötechnie*, Oct., 1903.)

HÆMORRHAGE AT THE BULB AND CEREBELLUM IN A DOG [*P. Lablanc*].—This case is interesting by the manifestations observed during life and the lesions of the post-mortem. A dog for a few days has shown locomotory troubles and carries his head in a peculiar way—that is, sideways; the tip of the nose turned to the left, and the line of the eyes having a rather vertical direction. The right eye is red and full of tears. The dog has a tendency in walking to turn round in the direction the head is bent, yet his intelligence is good; if coaxed he moves the tail friendly; if scolded he goes away. The appetite is poor, micturation and defecation normal. These symptoms lasted for a few days, then became more marked, and finally the dog died. The diagnosis had been made of hæmorrhage of the cerebellum and rachidian bulb. It was confirmed at the post-mortem. There was an hæmorrhagic centre on the inferior face of the bulb, to the right side, which extended into the substance of the cerebellum. There was another also on the left side, much smaller and slightly outside of the median line.—(*Journ. de M. Vet. and de Zoötechnie*, Oct., 1903.)

DENTAL DUPLICITY—TWO INFERIOR DIVIDERS UNITED [*Leon Dupas*].—In their work on the external form of the

horse, Goubaux and Barrier describe a dental irregularity by union of the superior dividers, and they remark that the abnormality is very rare. In this case the irregularity is different. At the lower jaw, instead of one divider on the right side, there are two united together in front of each other, while in Goubaux and Barrier they were side by side. The tooth which stands back has the same form as the left divider, but its posterior face is concave, instead of convex, and has a longitudinal groove. The front tooth is more regularly conical and its round table is much smaller.—(*Rec. de Med. Vet.*, Nov. 15, 1903.)

SPASMS OF THE THROAT DUE TO THE PRESENCE OF A HAIR IN THE PHARYNX [*G. Joly*].—This is probably unique in the history of foreign bodies in the organisms of animals. A thoroughbred mare, winner of several races, is sold to an officer. She feeds poorly, and from time to time, during and after meals, has spasms of the throat, with cough, salivation, uneasiness, general excitement, roaring; she stretches her head on the neck, and has great difficulty in breathing. These symptoms subside after the swallowing of a little water or again after several spells of coughing. Similar manifestations had already been observed in another horse which had been operated by arytenoidectomy, and on inquiring about this case, only marks of cicatrization from actual cauterization in points were detected on his throat. The length of time passed since the exhibition of the symptoms, the characteristic one of laryngeal spasms, the absence of arytenoidectomy and of foreign body suggested the possibility of a pedunculated tumor of the pharynx. Operation: The mare, cast and chloroformed, is tracheotomized. The mouth is wide open with speculum, and the hand and arm introduced, explore carefully the mouth, fauces, pharynx, and principally the posterior face of the epiglottis. Nothing abnormal is detected. The arm and hand are withdrawn, a woman's long hair is twisted round the wrist of the operator. A second exploration is again negative. The animal is relieved, the wound of tracheotomy treated. Cicatrization goes on rapidly and the spasms never return. Some two weeks later she is put to training, breaks down, and is sold. But since then she has never had any respiratory or digestive troubles; she roars no more. No doubt the hair was the cause of the mischief.—(*Revue Générale*, Dec. 1, 1903.)

RUPTURE OF THE RIGHT CARDIAC ARTERY [*M. L. Magnin*].—Rare observation, it is the second related in a veterinary journal. A mare, while exercised walking, suddenly stretches her

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neck, flexes on her legs, whinneys once or twice, goes on ten yards more and drops dead; in three minutes the act is over. As parasitic aneurisms of the great mesenteric have been frequent lately in that vicinity, death is attributed to an analogous lesion. At the post-mortem the entire organism is found normal, except the central cardiac apparatus. The pericardium is distended with a certain quantity of blood partly clotted, measuring about six litres. This has escaped by a rupture of the right cardiac artery—a longitudinal tear, irregular, zigzag like, at the point where the artery passes under the anterior auricle. There is a clot of blood as big as the two fists at the base of the heart on the anterior right and posterior faces of the aorta trunk. The inside of the heart is normal.—(*Rec. de Med. Vet.*, Nov. 15, 1903.)

PARALYSIS OF THE RADIAL NERVE IN A COW [*Mr. Bru*].—This animal, very rebellious to be covered, is secured in a peculiar way against a farm wagon, and when the bull is to serve her she struggles, and falls. When she is let loose, she gets up with difficulty and cannot carry weight on the left fore leg. This is flexed forward, and drags on the ground by the anterior face of the fetlock and of the phalanges when she is walked to her stall. She is treated by an empiric, who applied mild sedative frictions on the shoulder. After a week there is only slight improvement. The author was called, and found the animal lying down. Made to get up, she gave away several times on the left fore leg, resting on the foreface of the fetlock and phalanges. After several attempts she succeeded, not by flexing the knee, but by raising the shoulder, in placing the plantar face of the foot on the ground, and rested perfectly well on it. When made to walk, she did it on the fetlock, with phalanges flexed backwards. At the shoulder there was no swelling nor displacement of joints. Scapular muscles were normal, but those of the arm and forearm were atrophied, especially in the anterior and external part of the region. It was evidently a case of paralysis of the extensor muscles of the metacarpus and of the phalanges, which receive branches of the radial nerve. This nerve had been injured during the struggles of the cow. A severe blister was applied and the animal let loose every day. After eight days there was considerable improvement, in twelve the animal was to work.—(*Revue Veterin.*, Dec., 1903.)

CANALIZATION IN THE INTESTINE OF AN OVARIAN ABSCESS
—DEATH BY INTESTINAL STRANGULATION [*Armand Henry*].

—The second on record, this case was observed in a mare, aged eight years, which was taken with colic and died in fifteen hours after presenting abdominal pains, which showed nothing different from ordinary cases of similar nature nor anything which might indicate the lesions found after death. On opening the abdomen, attention was called immediately to a volvulus of the last portions of the small intestines. The organ was highly congested and even gangrenous in patches. This was evidently the cause of death. The volvulus was formed by a complete twist of the small intestine *round a cord*, whose relations were only observable after the intestine was entirely returned to its place. Then it was found that this cord was at one end inserted upon the hypertrophied left ovary and by the other on the small intestine at about 1m. 50 from the cæcal insertion. The cord measured 12 centimetres in length, and was irregularly conical. It had the size of a lead pencil and was hollowed in its whole length. A probe introduced in its canal from the intestinal end reached the ovary and brought out pus. The ovary was as big as the two fists, hard, and when it was cut, an old abscess was exposed. The cavity contained a yellowish concreted mass of pus. All the other organs were healthy. In the history of the mare it was observed that in three years she had had several attacks of colic, which were attributed to the fact that she was a bad cribber. She once exhibited symptoms which were regarded as due to nephritis.—(*Rec. de Med. Vet., Dec., 1903.*)

A PROMOTER of the goat industry recently sought to interest the Chicago City Health Department in a scheme to equip about 40 stations in Chicago with 10,000 goats for the purpose of supplying milk to Chicago infants, who do not thrive on the cows' milk commonly sold in the city. The city officials did not take to the idea for the reason that they could not see how the plan proposed could be put into practical operation.

EVEN if you can read the papers when you receive your copy of "Proceedings" of the St. Louis convention, you will miss the clinic, you will miss the pathological exhibit of the Bureau of Animal Industry, you will miss the friendly handshake of old companions and friends, and the opportunity to form new and lasting friendships; you will miss the opportunity to learn much, not only at the meeting, but in private interviews with veterinarians from everywhere. And you will miss the greatest World's Fair ever held. Can you afford it?

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ARMY VETERINARY DEPARTMENT.

PROPOSED NEW PETITION OF ARMY VETERINARIANS.

The following letter, draft of Bill and explanation, has been sent to us by Dr. Olof Schwarzkopf, 3d Cavalry, with the request of publication in the "Army Veterinary Department." He has forwarded the letter and inclosures to most army veterinarians, but not all could be reached, and he requests that those who have objections or wish to propose alterations, may write to Dr. J. H. Gould, 11th Cavalry, Fort Riley, Kansas.

FORT ASSINNIBOINE, MONT., May 23, 1904.

DEAR DOCTOR:—Perhaps you know that our last petition to the War Department has been a failure. As a result a new petition is being prepared by our colleagues at Fort Riley, asking for a commission of a first Lieutenancy without examination. In my judgment any such Bill is again destined to failure, with a loss of time of a year or more.

Inclosed I submit to you a draft of a Bill suggesting such changes in the veterinary service as appear most needed and helpful in our professional and individual advancement in the Army. A brief explanation is appended.

I have forwarded a copy to Fort Riley, asking our colleagues there to accept this Bill as a basis for their deliberations. Meanwhile I wish to have your personal views, and ask that you kindly reply stating whether you agree with me, and if not, what alterations you propose, and the reasons for same.

Sincerely yours, OLOF SCHWARZKOPF,
Vetr. 3d. Cavalry.

* * *

AN ACT TO PROMOTE THE EFFICIENCY OF THE VETERINARY SERVICE IN THE UNITED STATES ARMY.

Be it enacted by the Senate and House of Representatives, etc.

SEC. 1. That hereafter the veterinarians of Cavalry and Artillery, as now provided for by law, having five years of service and over, shall have the *grade*, pay and allowances of first Lieutenant, mounted, and shall be designated as "veterinarians": Provided: That promotion to the grade of veterinarian shall be made by seniority, after such examination for promotion as to general efficiency and professional qualifications, as the Secretary of War may direct.

SEC. 2. That the President may, with the advice and consent of the Senate, select from among the veterinarians so commissioned, three (3) veterinarians, who shall act as Chief-veterinarians, one for the Cavalry, one for the Artillery, and one for the Quartermaster's Department: Provided: That such acting Chief-veterinarians shall have been duly commended for exceptional competency, by their Regimental or Battalion Commanders, approved through military channels.

SEC. 3. That the veterinarians of Cavalry and Artillery, as provided now by law, having less than five years of service, shall have the *grade*, pay and allowances of second Lieutenant, mounted, and shall be designated as "assistant-veterinarians."

SEC. 4. That hereafter the veterinarians of Cavalry and Artillery, and the contract-veterinarians of the Quartermaster's Department, as authorized by law, shall be graduates of recognized universities or veterinary colleges having a course of not less than three years of nine months' duration.

SEC. 5. That nothing in this Act shall be construed as depriving any veterinarian of his appointment or contract in the Army, or as altering the Regimental and Corps assignments of veterinarians, or as increasing the number of veterinarians, as now authorized by law.

SEC. 6. That all laws and parts of laws inconsistent with the provisions of this Act be, and the same are hereby, repealed.

* * *

BRIEF EXPLANATION OF THE FEATURES OF THE BILL.

1. Note, that the purpose of the Bill is to promote the *efficiency of the veterinary service*, the only just reason for our improvement in the Army which will be recognized by the War Department and Congress. The idea of a *Veterinary Corps* is avoided because of old antagonism. To make sure, Sec. 5 maintains the Regimental and Corps assignments. Yet, we secure a working Organization under technical direction of acting Chief-veterinarians who will naturally also act as veterinary advisers to the War Department.

2. Note, that the titles are designated as "veterinarians," assistant-veterinarians, etc., and *not* as 2d or 1st *Lieutenant and Veterinarian*. Let us avoid to aspire of military titles which are the prerogatives of military officers, and be proud of our just title. The classification chosen enables us to ask for *grades*. The term *grade* includes *rank*. (See A. R., 1901, Article III, 9.) If we ask for a 1st Lieutenancy *alone*, we *must*

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ask for *rank*, which will at once arouse opposition. (For grades and professional titles compare Chaplain's Act, Sec. 2, G. O. No. 79, War Dpt., May 2, 1904.)

3. Note, that Sec. 3 changes our present *rank* (A. R. 9, line 10) to the grade, pay and allowances of 2d Lieutenant *without* further examination. Having passed an examination which is about equivalent to that demanded of 2d Lieutenants, it ought to be accepted as sufficient. Those of us who do not pass the examination for promotion to the grade of veterinarian after five years of service, thus secure the benefits of a commission with retirement pay, which is urgently needed for our two oldest members.

4. Note finally, that Sec. 4 provides for recognition of army veterinarians as graduates of professional veterinary colleges, a provision which has never been made, the absence of which puts us in a false light in the Army. Our limited educational standard has ever been, and still is, one of the chief objections raised against our advancement by influential and well-informed officers, who assert that the veterinary officers of foreign armies attain high rank because of the high education demanded of them. We must meet this statement by asking ourselves for a higher standard of education.

* * *

THE "NOCARD TREATMENT" FOR GLANDERS.

WAWONA, MARIPOSA CO., CAL., June 6, 1904.

Editors American Veterinary Review:

DEAR SIRs:—In the May number of the AMERICAN VETERINARY REVIEW, I noticed an article pertaining to the "Nocard Treatment of Glanders" in the Army.

I beg leave to state that, with the sanction of Gen. J. M. Bell, I tried to cure glanders in 1900 and 1901, in the Province of Camarines Sur, with repeated inoculations of mallein, without success. In one particular case, I succeeded in allaying all the objective symptoms of glanders. The characteristic nasal discharge ceased, the ulcers disappeared from the Schneiderian membrane, the submaxillary lymphatic glands resumed their normal size and consistency, the animal was high spirited and looked so well that, to the ordinary observer, he would easily pass for a sound horse. I had this animal shot, and upon post-mortem examination, performed in the presence of two M. D.'s and a number of officers, I found the lungs typical of glanders, an abscess in the liver, and the mesenteric lymphatic glands were all enlarged, indurated and ecchymosed.

This case I considered interesting in as much as it exemplified the *so-called* cure by mallein; yet, to my mind, it was simply a typical case of latent glanders.

I am not "from Missouri," but before I place any faith in all these "*cures*" by mallein, I must see a few more autopsies on some of these *cured* horses.

Very respectfully,

SAMUEL GLASSON, JR., D. V. S.,
Veterinarian 9th U. S. Cav.

* * *

THE "NOCARD TREATMENT" OF GLANDERS.

By OLOF SCHWARZKOPF, Veterinarian 3d Cavalry, Fort Assinniboine, Mont.

(Continued from page 292.)

History of the Second Outbreak in the Philippines.—On August 14, 1901, I was ordered to proceed to Camden, P. I., to examine the horses of another troop of the 3d Cavalry, among which glanders had been reported. It was the rainy season, and after a hard ride of two days through bottomless roads, I arrived there with my escort to find a complicated situation. I was shown four horses, isolated in an inclosure of bamboo poles, which presented highly developed cases of glanders, and a Board of Survey was immediately summoned to have the horses condemned and destroyed. The other horses of the Troop were kept on a picket-line protected only by high stone walls of the ruins of a church of ancient Spanish architecture and glory. On the other side of the church was a temporary canal in which about fifty horses of a mounted Infantry Company, and as many more wagon and pack mules, were kept separately and taken care of by different squads. The country around this village was flat, there was no natural drainage from the floods of rain, and the horses stood in the mud up to their ankles. It was a most unsanitary place by nature, and little could be done to improve it with the means on hand.

On examining the horses of the Troop I found three more cases of nasal glanders and a larger number of other horses which had to be looked upon as more or less suspicious. On the whole it was a thoroughly infected Troop, while the horses and mules on the other side of the church appeared healthy.

The history of the infection of the horses was the same old tale over again. The first case of glanders in this Troop was detected in May, 1900, at Bagnoton de Union, P. I.; but, for reasons unknown, the horse was not destroyed until July 29,

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1900. Gradually one case appeared after another, and, within about one year, *fifty-eight* (58) horses had died or had been killed for glanders. A larger number of new horses were then received which had been mingled with the surviving horses, and, at the time of my inspection, there were cases of glanders and suspects among both the survivors and the new horses. "No-card's treatment" certainly appealed as the only salvation. Accordingly I recommended the immediate requisition of the necessary amount of mallein, quarantined the horses of the Troop to prevent the infection of the other public animals, and returned to headquarters to report.

About three weeks later a telegraph from Camden announced the arrival of mallein. In the meantime I had been ill with dysentery, and although recovered and anxious to make the test myself, my commanding officer ordered Dr. S. Gelston, 3d Cavalry to Camden, in my stead, with instructions to proceed on the same lines as had been worked out during the test at Vigan. He made full and interesting verbal reports after each test; but, as he is no longer in the Army, the records of the test are taken from the office of the Troop, now stationed at this garrison. In extract they are as follows:

First mallein test at Camden, September 12, 1901.

Number of surviving horses in infected Troup	84
Proven healthy by first injection	49
Proven infected by first injection	35
	84

The forty-nine non-reacting horses were put on a new picket-line in a new location, and the horse equipments, saddles, bridles, blankets, brushes, curry combs, etc., were disinfected or destroyed. The thirty-five reacting horses were quarantined for a second test. Five of these horses developed acute cases of glanders within a few days, and they were promptly destroyed.

Second mallein test, November 28, 1901.

Number of horses in quarantine	30
Proven healthy by second test	24
Proven still infected	6
	30

The twenty-four non-reacting horses were returned to the

Troop for duty, and the six reacting horses were kept in quarantine for a third test. However, four of these six horses died of acute glanders within less than one month. In the meantime Dr. Gelston had been sent somewhere else, and the Troop had been ordered to Cervantes, Province of Banguet, in a mountainous region, so that the third test on these two horses which remained alive in quarantine, could not be made, and they were taken along with the Troop. They remained healthy thereafter, as did all the other horses of the Troop except one horse, which evidently died of chronic pulmonary glanders about six months later. As I could not find any detailed record of this case in the Troop office, I addressed a letter to the former farrier of the Troop, now Q. M. Sergeant Berkeley E. Barker, Troop D, 3d Cavalry, at Fort Yellowstone, Wyoming, who replies as follows:

"My sick-report book shows that this horse reacted locally to Dr. Gelston's first test; but, as there was no thermic or organ reaction, he considered it a case of septic infection, and returned the horse to duty. He continued poor and emaciated, presenting a hide-bound appearance, with cough, gradually getting worse, until death occurred January 26, 1902. The post-mortem showed one lung almost entirely destroyed, the other about half gone, what remained presenting a dark, ulcerated appearance, also the trachea, but none in the nasal sinuses. The horse never did show any of the usual, visible symptoms of glanders or farcy, such as discharges, ulceration, enlargement of submaxillary gland, etc."

Anticipating that some reader might be led to consider this mallein test as of doubtful value, on account of this reverse case, I also asked the Sergeant whether he considered this test a success so far as the suppression of glanders in this Troop is concerned, to which he replies:

"Yes, Sir, I did consider it a decided success. I also believe, from experience, that it has prevented infection in horses that were exposed to glanders and farcy in its most malignant form for three days at a time."

To this testimony could be added the opinion of the two officers of the Troop, who were most enthusiastic in their praise of the result obtained; but, as the farrier was an intelligent man and performed a large share of the work during both of the tests, and remained with the horses for over one year afterwards, his statement should be entirely creditable.

I shall refrain from making any comments on this test beyond stating my belief that a mistake was made in the case of the horse "with local reaction, but no thermic or organic reaction." We meet such cases in a large number of suspects. They serve as a warning to avoid a hasty decision, and that we can rely only on continued, careful observation and deliberate con-

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clusion. In the absence of a veterinarian, such cases are allowed to drag along by laymen in the hope of saving *one* animal, while all the good previously accomplished may be overturned by just one such case. In concluding the report of this mallein test at Camden, I may further express my belief that it was also a "crucial test" for mallein, for the horses of this Troop were certainly hopelessly infected. Nothing short of a slaughter of animals and destruction of equipments by fire would formerly have wiped out such a deep-rooted infection of over one year duration with such a high rate of mortality. Such serious condition is not likely to be faced in civil life in any civilized country, nor in any civilized army but ours. Yet by the scientific and humane "Nocard treatment," seventy-four horses were saved by careful weeding out of suspects, entailing no more than three months' time and labor.

(To be continued.)

STERILIZED MILK.—Robertson and Mair give the results of their study of the bacteriology of sterilized milk as supplied by the infant milk depot of Leith. They found bacteria in all but fifteen per cent. of the specimens examined, and reached the following conclusions: 1. The designation "sterilized" as applied to milk sold from municipal depots is wrong and misleading. 2. Every one should be instructed as to the necessity for keeping the milk as cool as possible. 3. Faith in the powers of steam sterilizers should not be too implicit. Each day's supply should be sold on the day on which it is prepared. 4. All bottles, after being taken from the sterilizer, should be placed in warm water and gradually cooled.—(*British Medical Journal*, May 14.)

DOCKING PROHIBITED IN IOWA.—The Iowa House of Representatives has passed a bill to forbid docking horses in Iowa. The committee on animal industry has reported adversely to the bill, but a minority report favored the bill. The minority report was submitted, and then an effort was made to amend the bill by attaching to it a provision in relation to high-checking of horses, but the Speaker ruled this out. The bill then passed by a vote of 68 to 13. During the course of the debate an attack was made on the agent of the American Humane Society, who had been at work for the bill, by accusing her of representing certain firms in Chicago engaged in horse docking, and declaring that the purpose of the bill was to prevent competition in Iowa.—(*Farmer's Advocate*.)

CORRESPONDENCE.

THE RIGHT TO PRACTICE IN NEW YORK STATE—THE RELATION OF AMERICAN COLLEGES TO THE REGENTS' REQUIREMENTS.

BINGHAMTON, N. Y., June 10, 1904.

Editors American Veterinary Review:

DEAR SIRs:—Could I be permitted through the REVIEW to answer a question which is frequently asked relating to the legal status of veterinary diplomas, as it bears upon the rights of the holder thereof to practice in New York? I have received letters from different parts of the country from prospective and actual students of several veterinary colleges, inquiring if a diploma from such college would entitle the holder to take the State examination, and if not would he be allowed to practice as an independent practitioner, or must it be under the protection of a preceptor. We have quite a number of graduates practicing in New York who are not registered and cannot do so legally, either because their college preparation is below the requirement established by law and the Board of Regents of the University of the State of New York, or because such practitioner has not taken the State examination, and also because the college from which some of the diplomas have been issued is not registered by the Regents or is not eligible to registration. Another source for illegal practice is through the medium of misinformation or intended deception on the part of the faculty of some of the colleges through their annual announcements, which hold the inducement that graduates of their college are eligible for the examination and entitled to practice in New York. The veterinary law has purposely set the standard of educational requirement high, it befriends the principal to get knowledge, it offers no inducement to the charlatan, it is sincere in its effort to protect the stock-owners of the State. The law demands that the student upon entering a veterinary college must possess the equivalent of a high school education, and that he must pursue his veterinary studies in not less than three full years, including three satisfactory courses in three different academic years, and this must be done in a veterinary school that is registered by the Regents as maintaining a standard of excellence in harmony with the educational and medical laws of the State. This, therefore, is the passport to the examination by the State Board. The Regents of the University of

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the State have established regulations whereby medical and veterinary schools are registered or accredited as maintaining satisfactory standards and are in two groups.

Group 1. Those registered or accredited for admission to the licensing examination of New York State after formal application authenticated by seal or affidavit and the signature of the executive officer.

Group 2. Those registered or accredited for admission to registered medical schools.

The registration of the medical schools has reference to the professional educational requirement and not to the general preliminary or the combined baccalaureate and medical which receive independent action. Schools are registered in full, or accredited in three classes, and all medical schools of standing will be found in one group or the other. It may be that strong schools are found in the second group from lack of formal application for registration in the first group.

Registered Schools. These are schools that require the full four-year medical course for matriculates subsequent to Jan. 1, 1898, who graduate subsequent to Jan. 1, 1902, and that make no allowance whatever for admission to advanced standing to graduates of schools of dentistry, pharmacy, veterinary medicine, osteopathy and the like, and that also meet New York's requirement in property, instructors, students, library, laboratory and clinical facilities.

Accredited Schools. These are of three classes:

1. Those that can be registered as having three full years of medicine.
2. Those that can be registered as having two full years of medicine.
3. Those that can be registered as having one full year of medicine.

VETERINARY MEDICAL SCHOOLS OF UNITED STATES AND CANADA.
REGISTERED OR ACCREDITED JUNE 1, 1904.

Alphabetically arranged by states and provinces.

UNITED STATES.

District of Columbia.

Group 2.—For admission to New York Veterinary Schools.—

United States College of Veterinary Surgeons—Class 1.

222 C. St., N. W., Washington; Dean, C. Barnwell Robinson.

Illinois.

Group 1.—For admission to New York Licensing Examination.—

Chicago Veterinary College—registered.

2537-39 State St., Chicago; Pres., R. J. Withers.
McKillip Veterinary College—Class 1.
1639 Wabash Ave., Chicago; Dean, F. S. Schoenleber.

Indiana.

Group 2.—For admission to New York Veterinary Schools.—
Indiana Veterinary College—Class 2.
Market St. (Davidson and Pine), Indianapolis; Dean, George H. Roberts.

Iowa.

Group 2.—For admission to New York Veterinary Schools.—
Veterinary Department, Iowa State College—Class 1.
Ames; Acting Dean, W. M. Beardshear.

Michigan.

Group 1.—For admission to New York Licensing Examination.—
Grand Rapids Veterinary College—Class 2.
Butterworth Ave. and Indiana St., Grand Rapids; Dean William A. McLean.

Missouri.

Group 1.—For admission to New York Licensing Examination.—
Kansas City Veterinary College—Class 1.
1404-6 Holmes St., Kansas City; Dean, Sesco Stewart.

New York.

Group 1.—For admission to New York Licensing Examination.—
New York-American Veterinary College.
New York University—registered.
141 W. 54th St., New York; Dean, Alexander F. Liautard.
New York State Veterinary College at Cornell University—
registered.
East Ave., Ithaca; Dean, James Law.

Ohio.

Group 1.—For admission to New York Licensing Examination.—
College of Veterinary Medicine, Ohio State University—Class 1.
N. High St., Columbus; Dean, David S. White.

Pennsylvania.

Group 2.—For admission to New York Veterinary Schools.—
Veterinary Department, University of Pennsylvania—registered.
Woodland Ave. (Cleveland and Spruce), Philadelphia; Dean, Leonard Pearson.

Washington.

Group 1.—For admission to New York Licensing Examination.—
School of Veterinary Science, Washington Agricultural College
and School of Science—Class 1.
Pullman; Pres., E. A. Bryan.

CANADA.

Ontario.

Group 2.—For admission to New York Veterinary Schools.—
Ontario Veterinary College—Class 2.
40-46 Temperance St., Toronto; Prin., Andrew Smith.

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Group 1.—For admission to New York Licensing Examination.—
School of Comparative Medicine and Veterinary Science (Laval
University)—Class 1.

185 St. Denis St., Montreal ; Director, V. T. Daubigny.

Very truly yours,

CLAUDE D. MORRIS,

Secretary State Board of Veterinary Medical Examiners.

AZOTURIA AND PARTURIENT PARESIS.

PROSPECT, OHIO, Feb. 8, 1904.

Editors American Veterinary Review:

DEAR SIRs:—In the February number of the most progressive AMERICAN VETERINARY REVIEW the foundation is laid for an exchange of views on azoturia and parturient paresis. That both diseases are auto-intoxications but little doubt can exist, although Dr. Corwin's name of motor-ataxia-myodinia does not appeal to the writer. Whether we are dealing with a primary myositis and subsequent disease of the nervous system, especially the crural nerve, or *vice versa*, is not quite certain, although the writer is rather inclined to believe in a primary myositis followed by disease of the nervous system. This view is based upon the fact that the writer has seen a number of cases of azoturia arise in the operating room, the horse being securely tied and struggling violently ; in other words, a struggling myositis, with all the symptoms of azoturia, and invariably fatal results. That is as far as the writer's Latin on azoturia goes.

Now, as to parturient paresis. For several years the writer made some special studies on this disease, resulting in the production of an antitoxin. This antitoxin has been used in a great many instances and with most excellent results, but some subsequent observations have shown that not the antitoxin but its method of application was the curative and preventive factor in parturient paresis. It matters not what you inject into the gland as long as it is aseptic, and, above all, fully distends the udder. By that is meant that the udder is so utterly filled with either sterilized water, saline infusions, iodide of potassium, trikresol, and water, air or oxygen, until the teats stand out boldly. Some doubt exists in the mind of the writer whether oxygen or a saline infusion is the more beneficent, either one combined with a hypodermic injection of one grain of strychnine sulphate. All around air and oxygen are the best ones to employ, as asepsis and quickness are most easily met with. Here is my confession

on parturient paresis: As long as the cow has to support the calf, things are nicely balanced in the mother, but as soon as the calf is born the amount of nutrition which the cow has been giving to the unborn for nine months, is suddenly thrown entirely upon the cow, and since she cannot use it, having plenty nutritive elements within herself for her own support, that very amount of food which she is to give the calf and no longer can give the calf, results in metabolic changes, followed by the production of a powerful and intensely depressing poison, expressed by a paretic state of the nervous system. By exciting the secretory functions of the udder a recovery takes place, provided the case is one of parturient paresis pure and simple. Right here is the hitch. Some practitioners have the best of results with iodide of potassium, others utterly fail, and so on. What points does the average veterinarian take into consideration when he makes the diagnosis of parturient paresis. If she had a calf recently and cannot get up or tosses about, etc., that settles the diagnosis of parturient paresis. As previously said, the writer has given this interesting disease quite some thought, and believes firmly that there is either another disease closely simulating parturient paresis, of sapræmic origin, calling it paralytic septic metritis, or that it is parturient paresis complicated with a sapræmic state. Not being sufficiently qualified to indulge in ultra-scientific research, this question is to be settled by the laboratory veterinarian.

On consulting the *Jahresbericht der Veterinar Medicin*, the following interesting data are found: Dr. Schmidt-Colding, to whom we are indebted for the iodide of potassium treatment, states that he prefers to use a 1 per cent. iodide of potassium solution, immediately followed by a liberal filling with sterilized air.

To return to paralytic metritis: Here quite a low percentage is saved. As far as the writer is concerned, the differential points between this latter disease and parturient paresis rest in the temperature, which is elevated in paralytic septic metritis, and especially in a manual examination of the os uteri. In those cases where the os uteri is flabby and covered with a thin slime and mixed with yellowish flakes, no recovery, or a very tardy one, is to be expected. In these cases the discharge is inodorous. In those cases where the discharge is smelling badly and thin and brownish, no recovery, or at least rarely so, will take place. In those cases where the os uteri is closed and covered with the regulation slime, one which is tenacious and

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free from flakes, iodide of potassium or anything else which is aseptic, and injected into the udder, distending it fully, will bring about a complete and, comparatively speaking, rapid recovery. Of course, it is understood that the cow is given proper care, as keeping her upon the left side, with leg folded under the body, head and neck propped, removal of the afterbirth, irrigation of the womb with antiseptics, and last, but not least, no medicine per mouth. W. E. A. WYMAN.

"A CURE FOR GLANDERS."

OMAHA, NEB., June 11, 1904.

Editors American Veterinary Review:

DEAR SIRS:—I found the enclosed clipping published in the *Nebraska Farmer*, date June 9. It was printed without comment by the editor, and I presume there will be a great rush amongst some to try this "specific". I think the best advice, or the most practical was to get out of the way quickly after the nostrum was administered.

Very truly yours,

G. R. YOUNG, D. V. S.

The clipping referred to is as follows:

"CURE FOR GLANDERS.—This disease is also known as influenza, strangles, distemper, catarrhal fever and nasal gleet. All are attended to a greater or less degree by loss of appetite and discharge from the nostrils and sometimes fever. I have a very simple and inexpensive treatment which I have never known to fail to effect a cure. Here it is in brief: Cast the animal. Select, if possible, soft ground for this I always rope same as when 'subduing' in the 'breaking' process. When the animal 'gives up' he lays down of his own accord thus reducing the danger of injury to a minimum. When the animal is down, have a strong man hold the nose up—*i. e.*, stand the head on end. Turn into each nostril a tablespoonful of granulated sugar. Follow this with a half pint of kerosene in each nostril; a long-necked bottle is best for this. Turn it in as the animal inhales. When both sides are treated, free the animal and keep out of his way, as he will do considerable blowing. Great care should be exercised not to get any pus on the hands or face. If you do, wash it off immediately. If this is done when the first symptoms appear, one dose will cure. If further advanced, repeat the operation every two or three days until cured. If abscesses are formed under the jaw, opening should be made to allow the escape of pus.—H. H. WATT, York, Neb."

BIBLIOGRAPHY.

DICTIONNAIRE VETERINAIRE (Veterinary Dictionary.) By P. Cagny and H. Y. Gobert. Published by J. B. Bailliere et fils, Paris.

In the REVIEW of August, 1902, I reviewed the first volume of this work. To-day I must consider the second volume, which completes the work. In speaking of the first part I remarked how well the plan followed by the authors had been gotten up and how indeed they had succeeded in making a practical work, scientific without being dogmatic—a work which would bring before the practitioners and the students, to whom it was addressed, a concise *résumé* of the present knowledge, as well as the indications of medical and surgical therapeutics generally admitted and sanctioned by practice.

The second volume contains 851 pages, with a little supplement, and is illuminated with 932 illustrations and four colored plates—thus making the entire work one of 1600 pages, with 1800 illustrations.

In looking over the material of the second volume, from Letter I to the end of the alphabet, we find lots of information, which, as the authors say, has been obtained from the experience and writings of many of the French authors (Chauveau, Nocard, Trasbot, Cadeau, Leclainche, etc.), in fact the cream of French veterinarians.

With the illustrations one is reminded of his rusty anatomical knowledge, gets fresh information for surgical manipulations, instruments or dressings, etc.

As I have said before, the dictionary is a good addition to French veterinary literature, and I will repeat the query: When will such a work find its way into ours? A. L.

DR. W. H. DALRYMPLE, of Louisiana, is visiting his aged mother in England, she being in her 90th year. He expects to return in time for the St. Louis meeting. We have no doubt the Doctor will utilize his spare time aboard ship in producing something of value for the meeting. He is always interesting, though, in whatever subject he engages, his great versatility and sound judgment giving to his remarks a charm which rivets the attention of veterinarians.

HAVE you the moral right to remain at home while your fellow veterinarians are at St. Louis striving to help you through advancing the interests of the profession which you have espoused?

TAME ANIMALS I HAVE KNOWN.

A thick-fleeced lamb came trotting by;
 "Pray, whither now, my lamb?" quoth I.
 "To have," said he, with ne'er a stop,
 "My wool clipped at the baa-baa shop."

I asked the dog: "Why all this din?"
 Said he: "I'm fashioned outside in,
 And all my days and nights I've tried
 My best to get the bark outside."

A hen was cackling loud and long.
 Said I to her: "How strange your song!"
 Said she: "'Tis scarce a song; in fact,
 It's just a lay, to be eggs-act."

I asked the cat: "Pray tell me why
 You love to sing?" She blinked her eye,
 "My purr-puss, sir, as you can see,
 Is to a-mews myself," said she.

A horse was being lashed one day.
 Said I: "Why don't you run away?"
 "Neigh, neigh! my stable mind," said he,
 "Still keeps its equine-imity."

I asked the cow. "Why don't you kick
 The man who whips you with the stick?"
 "Alas! I must be lashed," said she,
 "So I can give whipped cream, you see."

—*Saturday Evening Post.*

THE REPORT OF THE ENGLISH TUBERCULOSIS COMMISSION.
 —The Royal Commission, appointed in August, 1901, to investigate the relation of the tubercle bacillus of human and bovine origin, have made the following report: "We have most carefully compared the tuberculosis set up in bovine animals by material of human origin with that set up in bovine animals by material of bovine origin, and so far we have found the one, both in its broad general features and in its finer histological details, identical with the other. Our records contain accounts of post-mortem examination of bovine animals infected with tuberculosis material of human beings which might be used as typical descriptions of ordinary bovine tuberculosis. This, in the judgment of the commissioners, seems to show quite clearly it would be unwise to frame or modify legislative measures in accordance with the view that human and bovine tuberculosis bacilli are specifically different or that the disease caused by one is wholly different from the disease caused by the other."

SOCIETY MEETINGS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

PRELIMINARY ANNOUNCEMENT OF PROGRAMME.

5249 ADDISON ST., PHILADELPHIA, PA., June 24, 1904.

Editors American Veterinary Review:

DEAR SIRs:—I have the following papers to announce in addition to those reported in the June issue of the REVIEW:

"Vesicular Exanthema of Horses," Dr. Paul Fischer, Columbus, O.

A paper (subject not selected), Dr. John W. Adams, Philadelphia.

"Canine Distemper," Dr. Lemuel Pope, Jr., Portsmouth, N. H.

Thus far none of our Canadian members have offered a contribution to the programme, but, taking into account their enthusiasm and intense interest in the progress and welfare of our Association, it is not to be doubted that we will have abundant aid from that quarter. I expect to be able to set forth in the printed announcement a literary programme replete with good features and showing that no section of our membership has failed to do its part. The copy for the announcement must be in the hands of the printer by July 10th and it will be necessary for those who desire to take part in the programme to report to me prior to that date. A departure from the usual custom will be made this year in that the duty of opening the discussion of each paper will be assigned to two members. It is thought that this plan will serve to get the discussion well started and to encourage a full discussion of each paper, something that is extremely important.

Dr. J. C. Norton, of Phoenix, Arizona, one of our members and President of the Interstate Association of Live Stock Sanitary Boards, informs me that that organization will hold its annual meeting in St. Louis Aug. 23d to 25th, and says that he is very anxious that the veterinary profession be well represented at that meeting. He extends a cordial invitation to all of our members to be present, and it is hoped that as many as possible will arrange to remain in St. Louis so that they may have the benefits of that convention.

I am authorized to announce that at our clinic, Dr. C. C. Lyford, of Minneapolis, will operate for quittor or sidebones, or both, and that Dr. W. C. Holden, of Delphos, O., will perform

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oöphorectomy upon the mare or a cryptorchid castration or both, depending upon the material available. The other part of the clinical programme has not yet been completed by the local committee, but assurance is given that an excellent clinic will be provided.

Dr. Chester Miller, Chairman of the Committee of Arrangements at St. Louis, informs me that after careful investigation his committee has decided upon headquarters, and has succeeded in fixing reasonable rates for accommodations. Our headquarters will be at the Monticello Hotel, corner of Pine Boulevard and Kingshighway. The convention hall and World's Fair grounds can easily be reached from the hotel, as it is right at the edge of the park in which the Exposition is being held. The hotel is reached from Union Station by the Laclede Avenue cars in a 25-minute run. The rates will be \$6 per day for a room with private bath to accommodate four people to a room. This will be \$1.50 per day each. The proprietor is giving special rates and says he will turn the entire hotel over to us if we can utilize 100 rooms. He is desirous of filling every room and will give the above rate to any one directed there by any member of the Association. He desires a minimum estimate of the attendance by July 20th. Any one who reads this and intends to go to St. Louis at the time of our meeting will confer a favor upon the local committee and at the same time solve for himself the knotty problem of accommodations at the World's Fair by writing to Dr. Chester Miller, 5230 Ridge Avenue, St. Louis, stating the time of his arrival and the number in his party. Dr. Miller says, "I am satisfied we have one of the nicest and most comfortable hotels in the city."

Our convention hall will be located on the World's Fair grounds and our clinic will probably be held in a building which is located inside of the grounds. Dr. Miller reports that other matters in connection with the local arrangements are progressing satisfactorily and that plans will be completed within a short time.

I desire to call special attention to the exhibit by the Bureau of Animal Industry of the United States Department of Agriculture at the World's Fair. I have been informed that this is the most extensive exhibit the Bureau has yet made, and that it alone would repay a trip to St. Louis to those interested in veterinary medicine. As our headquarters will be right at the edge of the Fair grounds, and as our sessions and clinic will be held on the Fair grounds it may be said that this exhibit of the Bureau

of Animal Industry really forms an integral part of our convention.

It seems that never in the history of our Association has the prospect for a meeting been so good, or the attractions so great as offered this year, and there should not be the least doubt in the mind of any veterinarian, or anyone else with an interest in veterinary affairs, that he should visit St. Louis during the Exposition, and that by far the best time to make that visit is at such dates as will include the 41st annual convention of the American Veterinary Medical Association. This is the year, and St. Louis is the place for the veterinarians of America and their friends to conspire to make a meeting which will ever remain historic in the annals of the Association. If it is not done now, an opportunity will be lost, the like of which may not recur for many a year. It can be done if each will arouse himself to a full appreciation of his duties and responsibilities to a great profession.

Much has been said in reference to the rates charged by hotels in St. Louis. It has been asserted that these rates have been exorbitant. Whatever the truth or falsity of this may be in individual instances, it cannot apply to our case because our committee has succeeded in arranging for a fixed rate so that each one who attends the meeting in care of the A. V. M. A. is assured of good quarters, at a reasonable rate fixed in advance.

Very little need be said in reference to rates of transportation. The various passenger traffic associations have fixed rates to continue throughout the progress of the Fair. From these rates there is no variation. There are 10-day rates, 15-day rates, rates by optional routes, and rates for the entire time of the Fair. Any of these rates can be selected by those attending our meeting, each suiting his own purposes. It may even be found by some that they can avail themselves of coach excursion rates, which usually are equal to one fare for the round trip. The 15-day rate, which will probably be suitable for most, averages in most of the associations one fare plus \$2 for the round trip. Each one can very easily determine for himself the accommodations and the rates by consulting his ticket agent, and can select those which he finds the most suitable to his own case.

The social part of the programme will be the World's Fair and various other forms of amusement, the details of which the local committee are working out. The mere mention of this should be sufficient foundation for our members and their friends to picture for themselves the possibilities that attendance

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at our meeting will give them in the line of entertainment.

It is expected that the members and visiting veterinarians in laying their plans for going to St. Louis will not forget the other side of the house.

JOHN J. REPP, *Secretary*.

PASSAIC COUNTY VETERINARY MEDICAL ASSOCIATION.

The regular monthly meeting was held at Dr. Geo. W. Pope's office, at United States Quarantine Station, Athenia, N. J., June 7, 1904, with President Dr. Wm. Herbert Lowe in the chair, and was called to order at 8.30 P. M. The following members were present at roll-call: Drs. J. H. Degraw, Wm. J. Fredericks, Geo. W. Pope, Wm. Herbert Lowe, W. H. Lowe, Jr., J. Payne Lowe and W. J. Reagan.

The minutes of last meeting were read and approved.

The Secretary reported that he had received a communication from Dr. J. M. Phillips, of St. Louis, stating that he had accepted the order for the six stomach tubes ordered for members of the Passaic County Veterinary Medical Association, so that they could adopt the latest treatment for cases of acute indigestion, gastric flatulence and gastritis.

The State Board of Examiners will meet at the State Capitol on June 28 and 29, for the purpose of licensing veterinarians to legally practice in the State of New Jersey.

The semi-annual meeting of the New Jersey State Veterinary Medical Association will be held at Newark, Thursday, July 14, 1904.

Dr. Geo. W. Pope read a valuable paper on "Lameness of the Horse," and pointed out some of the difficulties that the veterinarian has to contend with between the learned coachman and the owner. Dr. Pope received a vote of thanks from the veterinarians present for his valuable paper, and it was voted that it be sent to the AMERICAN VETERINARY REVIEW for publication. This paper was then discussed by the members present, and there were some valuable points brought out.

All the veterinarians present at this meeting were invited to inspect the stock in the Quarantine Station at this time. When we reached the stables we found some very valuable animals, such as a herd of Jersey cattle that expect to be at the St. Louis Fair after being released at the Quarantine Station, and some Egyptian goats and a Brandel bull that is to be on exhibition at Coney Island this season.

After the veterinarians had made an inspection of the stock in quarantine, the meeting was adjourned until our next regular monthly meeting, to be held on July 5, at Paterson.

WM. J. FREDERICKS, *Secretary*.

COLORADO VETERINARY MEDICAL ASSOCIATION.

This Association held its semi-annual meeting June 6, at Denver, and the attendance was very good, considering the time of year.

A clinic was held at Dr. M. J. Dunleavy's Hospital. Dr. A. B. McCapes operated on two ridglings, and was highly commended upon his method of casting and operating, which were done very neatly and quickly.

Dr. F. W. Culver, of Longmont, Colo., read a very interesting paper on "Pyæmic Arthritis," which brought forth considerable discussion.

The Association adopted the following resolution:

"WHEREAS, It is the sense of the Colorado Veterinary Medical Association, now in session, that the requirements for matriculation in the veterinary colleges throughout the United States and Canada, should be brought to a higher standard and placed on a uniform basis; we believe that under the present requirements the educational qualifications of the applicants are in many instances of trivial consequence, provided they have the entrance-fee and can sign their names to the register. Therefore, be it

"*Resolved*, That it is the sense of this Association that in no other way can the standard of the veterinary profession be brought to the high degree which its importance justifies, and we hold that the qualifications for admission should be a high school graduation or its equivalent. Be it, further

"*Resolved*, That the veterinary profession make it its plain duty to see that no charter is granted for any veterinary educational institution, the actual need of which does not exist beyond the shadow of a doubt. We also hold that if the State Examining Boards would do their full duty, it would eliminate unworthy colleges, and raise the standard of veterinary education generally. We would suggest that the State Superintendent of Public Instruction might be authorized to see that no educationally or morally disqualified person be allowed to matriculate for the study of veterinary medicine."

The Association adjourned to meet the first Monday in January, 1905.

M. J. WOODLIFFE, *Secretary*.

NEWS AND ITEMS.

"If the dog's prayer were heard, there would be a shower of bones from heaven."

"ALLOW me to tender my congratulations for the continued steady improvement the REVIEW is making."—(*G. R. Young, D. V. S., Omaha, Neb.*)

"SCABIES IN SHEEP AND CATTLE AND MANGE IN HORSES," is the title of Bulletin No. 61 of the North Dakota Experiment Station, and is a scientific exposition of the subjects by L. Van Es, M. D., V. S., Station Veterinarian.

A SHETLAND PONY COLT, weighing twelve pounds at twelve hours old, is shown with its dam in an illustration in the *Breeder's Gazette*, of June 15. He was bred in Illinois, and appears healthy and strong.

MANGE has again been discovered among Kansas cattle in all of the counties west of the east line of Hodgeman and Ness Counties, except in Trego and Graham. A strict quarantine has been ordered. No cattle can be moved from one pasture to another in the district until they have been dipped in some mixture authorized by the State Sanitary Commission.

BOSTON'S WORK HORSE PARADE was a success from every point of view. More horses were in line than ever were driven in Boston since the parade was inaugurated and the institution of the prizes for long service proved the main feature of the whole affair. The good effect of the parade on the care and condition of Boston's horses was very apparent.

A PROLIFIC COW.—Mr. James A. Pennell, Macgregor, Canada, writes to the *Farmers' Advocate*, of Winnipeg, Manitoba, as follows: "I have a cow, not eight years old until July. She has given me twelve calves. When she was two years old, she gave me one; the three following years, she gave me twins; the year following, she gave me triplets, and now, again this year, she has given me twins, which makes in all twelve calves in five years."

GERMANY TO INVESTIGATE AMERICAN HORSE-BREEDING.—Cable messages indicate that the German Emperor has decided that a special expert on horse breeding, Dr. Grabensee, will go to St. Louis for the German Government to make himself thoroughly acquainted with the breeding of horses in the United States. Dr. Grabensee will go direct to St. Louis to spend a couple of weeks, and will then start on an extended trip throughout the United States.

BEAUMONT CRUDE OIL was recently used with success in killing Texas fever ticks on cattle dipped in it at Fort Worth, Tex. Officials in charge of the experiment state that after one dipping in the crude oil, which contains no petroleum and is not injurious to the cattle, they were unable to find any ticks on the animals after the sixth or seventh day. The process is inexpensive and if subsequent experiments prove it a success, it will be of great importance to the cattle industry in the Southwest.—(*Breeder's Gazette*.)

KOCH'S WORK IN SOUTH AFRICA.—Prof. Koch, according to a cablegram from Berlin, has discovered a new serum for the prevention of the cattle, mule and horse epidemics which have been killing animals in the South African herds. It is stated that the Government of Rhodesia paid Prof. Koch \$150,000 for his services. Koch has discovered also that the African rinderpest is radically different from the American Texas fever, the belief having previously existed that the former was imported from America by cattle from the South.

A "GENERAL-PURPOSE" COW.—The following from the New York *Tribune* shows that the special-purpose cow has been again outclassed in a "public" test. "John Sutphin, a Franklin Park (N. J.) farmer, asked the police to help him find a pet heifer which had strayed away from his farm. He declared she was a great fish catcher, and frequently would go to ponds on the farm, stand motionless for a time in the water near the bank, then suddenly thrust her head in the water and bring up a small fish in her mouth. On the advice of the police and with their aid, the shores of the Raritan river were searched. The heifer was found watching for fish near the landing bridge."

SURRA TRYPANOSOME.—Novy, McNeal, and Hare reach the following conclusions: (1) The trypanosome present in the Philippine surra can be cultivated artificially. (2) Attenuated cultures of this organism can be obtained as in the case of *Tr. brucei*. (3) This trypanosome is differentiated by its cultural characteristics from *Tr. lewisi* and from *Tr. brucei*. (4) The Philippine surra is, therefore, a distinct disease, different from nagana, and this observation confirms the work of Laveran and Mesnil on the non-identity of nagana and the surra of Mauritius. (5) The morphological differences between the Mauritian and Philippine trypanosomes suggest the probability that these organisms are distinct species, and hence that the term surra covers a group of closely allied diseases.—(*Journal of the American Medical Association*, May 28.)

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VETERINARY MEDICAL ASSOCIATION MEETINGS.

In the accompanying table will be found the dates, places of meeting, and Secretaries' names and addresses of all the Veterinary Medical Associations of the United States and Canada, so far as obtainable by the REVIEW. Secretaries are urgently requested to see that the organizations which they represent are properly included in the list.

Name of Organization.	Date of Next Meeting.	Place of Meeting	Name and Address Secretary.
American V. M. Ass'n.....	Aug. 16-19, '04.	St. Louis, Mo.	J. J. Repp, 5249 Addison St., Phila., Pa.
Vet. Med. Ass'n of N. J.....	July 14, 1904.	Newark.	G. W. Pope, Athenia, N. J.
Connecticut V. M. Ass'n.....	August 2.	Waterbury.	B. K. Dow, Willimantic.
New York S. V. M. Soc'y.....	September, 1904	Brooklyn.	W. H. Kelly, Albany, N. Y.
Schuylkill Valley V. M. A....	.....	.....	W. G. Huyett, Wernersville, Pa.
Passaic Co. V. M. Ass'n.....	July 5.	Paterson, N. J.	W. G. Fredericks, Delawanna, N. J.
Texas V. M. Ass'n.....	.....	.....	H. D. Paxson, Ft. Worth.
Massachusetts Vet. Ass'n.....	Monthly.	Boston.	F. J. Babbitt, Lynn, Mass.
Maine Vet. Med. Ass'n.....	July, 1904.	Bar Harbor	C. L. Blakely, Augusta.
Central Canada V. Ass'n.....	.....	Ottawa.	A. E. James, Ottawa.
Michigan State V. M. Ass'n....	.....	.....	Judson Black, Richmond.
Alumni Ass'n N. Y.-A. V. C....	April, 1905.	141 W. 54th St	W. C. Miller, N. Y. City.
Illinois State V. M. Ass'n.....	December.	Chicago.	W. H. Welch, Lexington, Ill
Wisconsin Soc. Vet. Grad.....	Call of Pres't.	Racine.	S. Beattie, Madison.
Illinois V. M. and Surg. A....	August, 1904.	Decatur.	W. A. Swain, Mt. Pleasant, Ill
Vet. Ass'n of Manitoba.....	July, 1904.	Winnipeg.	F. Torrance, Winnipeg.
North Carolina V. M. Ass'n....	July, 1904.	Greensboro.	T. B. Carroll, Wilmington.
Ontario Vet. Ass'n.....	December, 1904	Toronto.	C. H. Sweetapple, Toronto.
V. M. Ass'n New York Co....	1st Wednesday of each month.	141 W. 54th St	D. J. Mangan, N. Y. City.
Ohio State V. M. Ass'n.....	August, 1904.	St. Louis, Mo.	W. H. Gribble, Washington C. H.
Western Penn. V. M. Ass'n....	1st Wednesday of each month.	Pittsburgh.	F. Weitzell, Allegheny.
Missouri Vet. Med. Ass'n.....	Aug. 15, 1904.	St. Louis.	Stanley Smith, Columbia.
Genesee Valley V. M. Ass'n....	.....	.....	J. H. Taylor, Henrietta, N. Y.
Iowa State V. M. Ass'n.....	.....	.....	H. C. Simpson, Denison, Ia.
Minnesota State V. M. Ass'n...	July 14-15, '04	Litchfield.	J. G. Annand, Minneapolis.
Pennsylvania State V. M. A....	.....	.....	C. J. Marshall, 2004 Pine St., Phila.
Keystone V. M. Ass'n.....	2d Tuesday of each month.	Philadelphia.	C. J. Marshall, 2004 Pine St., Phila.
Colorado State V. M. Ass'n....	1st Mon. in June	Denver.	M. J. Woodliffe, Denver.
Missouri Valley V. Ass'n.....	.....	.....	B. F. Kaupp, 3712 Michigan Ave., Kansas City.
Rhode Island V. M. Ass'n....	.....	.....	T. E. Robinson, Westerly, R. I.
North Dakota V. M. Ass'n....	2d Tues. Jan.	Fargo.	E. J. Davidson, Grand Forks
California State V. M. Ass'n....	Mch. Je. Sep, Dec	San Francisco	P. H. Browning, San Jose.
Southern Auxiliary of California State V. M. Ass'n....	Jan, Apl, Jy, Oct.	Los Angeles.	H. D. Fenimore, Los Angeles
South Dakota V. M. A.....	.....	.....	E. L. Moore, Brookings.
Nebraska V. M. Ass'n.....	.....	.....	A. T. Peters, Lincoln.
Kansas State V. M. Ass'n....	January, 1905.	Topeka.	Hugh S. Maxwell, Salina.
Alumni Association A. V. Col..	April each yr.	New York.	F. R. Hanson, N. Y. City.

PUBLISHERS' DEPARTMENT.

Subscription price, \$3 per annum, invariably in advance; foreign countries, \$3.60; students while attending college, \$2; single copies, 25 cents.

Rejected manuscripts will not be returned unless postage is forwarded.

Subscribers are earnestly requested to notify the Business Manager immediately upon changing their address.

EXTRACT OF BULLETIN 62 UPON THE SUBJECT OF "DISINFECTANTS," ISSUED BY OKLAHOMA EXPERIMENT STATION.

One of the most interesting Experiment Station Bulletins that has been issued recently is now being sent out by the Oklahoma Experiment Station at Stillwater, Oklahoma. The title of the bulletin is "A Test of the Disinfecting Powers of Coal-Tar Dips." It is the work of Dr. L. L. Lewis, Veterinarian to the Station, and Professor J. F. Nicholson, Assistant in Bacteriology.

The experiments are especially interesting because of the fact that they are the first of their kind officially conducted and published, and also because they furnish absolutely reliable information upon a subject that is of vital interest to Veterinarians and live-stock men.

Many Veterinarians have not hesitated in the past to recommend Zenoleum for general disinfection, and the editorial and veterinary pages of some of our best agricultural papers have frequently endorsed and prescribed Zenoleum.

Some people have not felt, however, that the publications have been warranted in taking such a stand. This has doubtless been due to the lack of personal experience with Zenoleum, and the lack of official demonstration of the disinfecting powers of Zenoleum.

Oklahoma Bulletin No. 62 confirms the claims made by the Zenner Disinfectant Company, that Zenoleum is the peer of all disinfectants.

In the experiments conducted the following germs were used: Hog cholera; Swine plague; *M. aureus* (pus organism); *B. coli* (intestinal organism); *B. subtilis* (hay bacillus); *B. anthracis* (anthrax); *B. typhosus* (typhoid fever).

(*B. subtilis* and *B. anthracis* were in the non-spore forming condition. The spore forms are more resistant.)

The Zenoleum used in these tests was bought on the open market and had been in the laboratory two years before the test was begun. All the tests were run in duplicate.

Six coal-tar preparations were tested. Of these two failed to kill *B. subtilis* and *B. anthracis* in thirty minutes. One killed *B. anthracis* in fifteen minutes and failed to kill *B. subtilis* in thirty minutes. Two others killed *B. subtilis* in three minutes and failed to kill *B. anthracis* in thirty minutes.

Following is the record of Zenoleum: Germ of Hog cholera, killed at once; Germ of Swine plague, killed at once; *M. aureus*, killed in one-half minute; *B. coli*, killed at once; *B. subtilis*, killed in three minutes; *B. anthracis*, killed in three minutes.

It will be seen from the above, that the claim of the manufacturers of Zenoleum, that their product is an absolutely sure disinfectant, is well borne out. *B. subtilis* and *B. anthracis* are exceedingly resistant germs and the fact that a one per cent. solution of Zenoleum was efficient in destroying these germs in three minutes is a very high tribute to the disinfecting powers of this well known product. Only one of the other dips tested destroyed *B. subtilis*, and none of the others destroyed the germ of anthrax, even though they were given half an hour to do so.

Dr. Lewis tested kerosene emulsion and carbolic acid, two products that are frequently used in disinfecting work. Concerning the former he says, "_____ is not sold as a disinfectant but as a sheep dip, and kerosene emulsion, commonly used as a dip and wash to kill lice, were tested to determine their disinfecting properties. The results show that neither preparation has any qualities as a disinfectant, sufficient to warrant its use."

The results of the test of carbolic acid show clearly that it is not as efficient as Zenoleum. Commenting upon the use of carbolic acid, Dr. Lewis says, Zenoleum, as compared with the former, is cheaper, is certainly as effective and is not so dangerous to use. In tests with the much dreaded *B. typhosus* (typhoid fever germ) Zenoleum proved more effective than carbolic acid. Zenoleum killed these germs at once. This is a fact that should be borne in mind in purchasing a disinfectant.

Commenting upon the coal-tar preparations, Dr. Lewis says, "they are cheap and non-poisonous and should be used extensively where disinfectants are necessary. Even when there is no contagious or infectious diseases that would require the use of such remedies, there is hardly a time on the stock farm when there is not occasion to use such remedies in dressing sores, wire-cuts, etc. They are not irritating, and may be used in wounds or sores without injury to the tissue. Such diseases as Hog Cholera, Swine Plague, Glanders, etc., are infectious and animals may easily contract them by being placed in stalls or pens where diseased animals have been."

It must be remembered that Zenoleum was effective under the most severe requirements, in a one per cent. solution in three minutes, while some of the other disinfectants tested did not prove germicidal when the tests were discontinued and certainly the result of the experiments at Oklahoma Agricultural College is demonstrative of the efficiency of Zenoleum as a disinfectant, and should convince the most skeptical that they are warranted in pinning their faith to Zenoleum.

PRACTICE FOR SALE.

A good city practice of \$4,000 per annum (easily increased to \$6,000) in a thriving city in Illinois, for sale on account of ill health of family—could not be induced to leave under any other circumstances. A cash offer is solicited. Address, P. F. S., care of AMERICAN VETERINARY REVIEW, 509 West 152d Street, New York.

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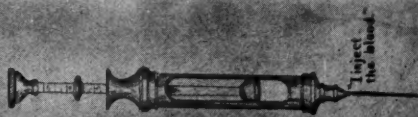
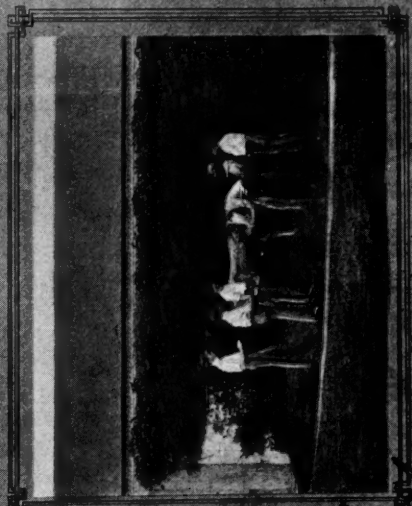
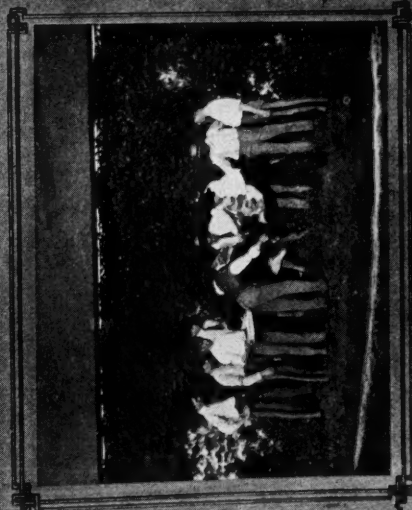
TEXAS FEVER

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EXPERIMENT
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Northern Male Trio: Southern is the Surety South, and get insurance.



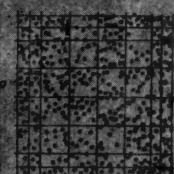
"I find the temperature."

"I find the blood."

"Inject the blood."



"Red cells in Texas fever blood."



"Red cells in normal blood."



"I measure the germ."



"I am the germ of Texas fever."

IMMUNIZATION.

W. J. H. H.

IMMUNIZATION.

The accompanying cut is from the photo of a chart (28 x 22 inches,) prepared by Dr W. H. Dalrymple, of the Louisiana State University and Experiment Station, for the Louisiana Exhibit at St. Louis, and tells the story of Texas Fever Immunization by illustration.

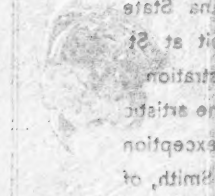
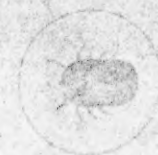
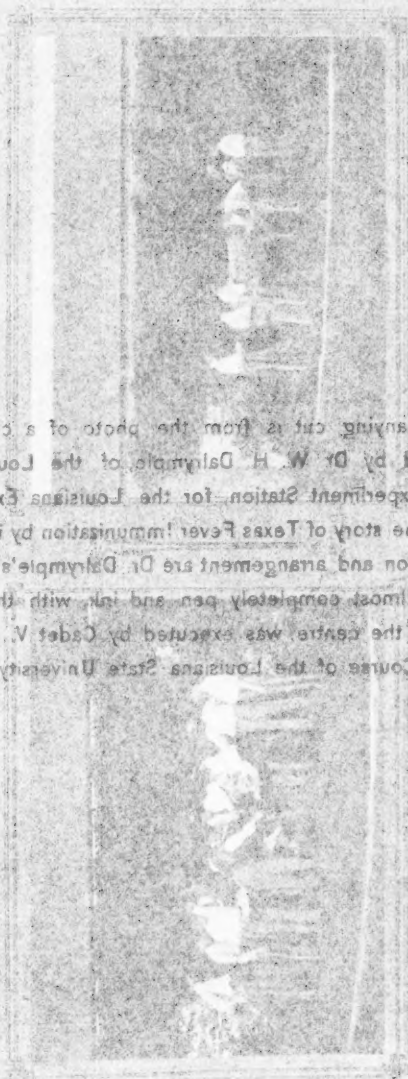
The conception and arrangement are Dr. Dalrymple's; the artistic work, which is almost completely pen and ink, with the exception of the photos in the centre, was executed by Cadet V. E. Smith, of the Mechanical Course of the Louisiana State University.

TEXAS FEVER

LASTATE
UNIVERSITY

EXPERIMENT
STATION

The accompanying cut is from the photo of a chart (28 x 22 inches) prepared by Dr. W. H. Dalrymple of the Louisiana State University and Experiment Station for the Louisiana Exhibit at St. Louis and tells the story of Texas Fever immunization by illustration. The conception and arrangement are Dr. Dalrymple's; the artistic work, which is almost completely pen and ink with the exception of the photos in the center, was executed by Cadet V. E. Smith of the Mechanical Course of the Louisiana State University.



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